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CONTENTS Page 1. INDEX TO ADVERTISEMENTS Page 2.

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EXCISION OF THE KNEE-JOINT AS A METHOD OF TREATMENT FOR SEVERE INFECTIONS.

BY

COLONEL ANDREW FULLERTON, C.M.G., A.M.S., M.D., M.Ch., F.R.C.S.Irel.,

CONSULTING SURGEON, BRITISH EXPEDITIONARY FORCE.

THE treatment of wounds of the knee-joint produced in warfare has received a good deal of attention of late, and much progress has been made. Colonel Gray and his followers have done much to perfect what may be called the "closed" method. Excision of septic wounds into the joint and removal of foreign bodies, if present, followed by complete suture of the synovial membrane, is now the almost universal practice among British surgeons in France. The results of drainage of the joint by tubes, as we used to see them in earlier days, were disastrous. Old traditions die hard, and officers fresh from England are still inclined to adopt the system of drainage recommended in textbooks of surgery. This is to open the suprapatellar pouch or incise on either side of the patella and insert drainage tubes in cases of infection of the joint.

Our experience has been that quite a fair proportion of distended knee-joints containing actual pus, from which micro-organisms may be grown, settle down and recover

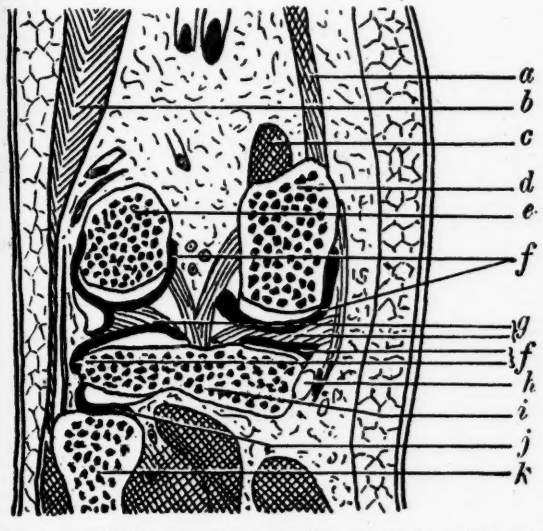

FIG. 1.—Vertical transverse section through joint. *a*, Adductor magnus muscle; *b*, biceps muscle; *c*, inner head of gastrocnemius muscle; *d*, inner condyle of femur; *e*, external condyle of femur; *f*, joint cavity; *g*, semilunar cartilage; *h*, tendon of semimembranosus muscle; *i*, tibia; *j*, superior tibio-fibula joint; *k*, head of fibula.

movement after aspiration, aspiration and irrigation, or aspiration followed by the injection of such substances as glycerine and formalin (a few cubic centimetres of a 2 per cent. solution at least forty-eight hours old), or ether. In a certain proportion of cases, however, this line of treatment fails. The joint fills up again and again with pus, the cells of which perhaps show diminishing instead of increasing phagocytosis. Pain in the joint increases, the temperature rises, the pulse increases in frequency, and the general condition of the patient becomes such that it is obvious that something radical must be done to save his life if not his limb.

One is often asked why the old method of drainage by inserting tubes into the joint is not to be adopted; it is surely one of the canons of surgery that pus must be "let out" and an infected joint drained. For reply we point to our unfavourable experience of its results in this war. The introduction of drainage tubes favours the entrance of microbes other than the original offenders, and a mixed infection is only too certain to result. Lieutenant-Colonel Elder, who has taken a great interest in this branch of work, invited me to follow with him a series of cases of wounds of the knee-joint. In eleven cases tubes had been introduced into the joint shortly after injury and before arrival at his hospital. Three of these cases required amputation to save life, five were evacuated to England with total disorganization of the joint and sinuses still discharging, and three gave promise of slight movement. These results are not encouraging. Similar results, or worse, have been common in the experience of other surgeons in France.

The difficulties one has to contend with in dealing with an infected knee-joint will be apparent when the anatomy of the articulation is studied. I have elsewhere[1] illustrated by drawings of sections through the joint at different levels and in several planes the various recesses, diverticula, and communications with bursae which militate against satisfactory drainage. These show conclusively, I think, that the best attempts at drainage must be inefficient. It is, in fact, impossible to drain the knee-joint. Let us consider the methods formerly adopted. Incisions were made on either side of the patella or into the suprapatellar pouch, which is in communication, as a rule, with a further extension in the form of a bursa—the suprapatellar bursa (Fig. 2). These parts appear to be the situations most requiring drainage on account of their obvious swelling and tenseness. They only receive, however, the overflow from the joint proper, which is just as tensely filled, though this is not so obvious on account of the surrounding resistant structures. The pockets between and around the cruciate ligaments in the intercondyloid fossa (Figs. 1, 2) are left undrained. These cannot be reached for dependent drainage except through the popliteal space, the posterior ligament, and a thick layer of tissue, which includes the

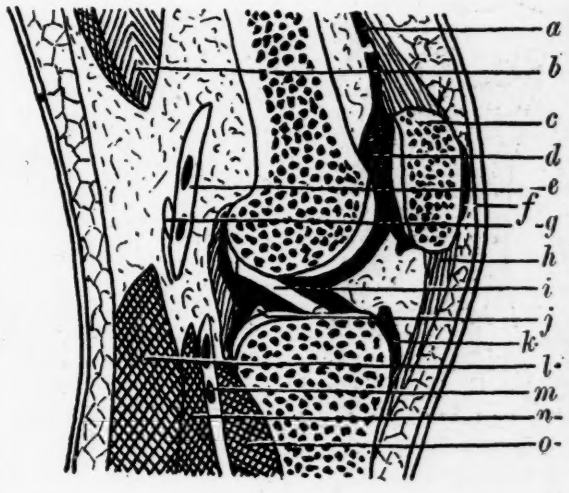

FIG. 2.—Vertical antero-posterior section through middle of joint. *a*, suprapatellar bursa; *b*, semimembranosus muscle; *c*, patella; *d*, joint cavity; *e*, popliteal vein; *f*, prepatellar bursa; *g*, peroneal nerve; *h*, patellar ligament; *i*, anterior cruciate ligament; *j*, posterior cruciate ligament; *k*, bursa over tubercle of tibia; *l*, gastrocnemius muscle; *m*, popliteal artery; *n*, soleus muscle; *o*, popliteus muscle.

posterior cruciate ligament (Fig. 2). The pouches surrounding the condyles of the femur posteriorly, the interstices between the semilunar fibro-cartilages the lateral ligaments and the bones (Fig. 1), and the tube of synovial membrane which accompanies the popliteus tendon as it passes over the external semilunar cartilage and the superior tibio-fibular joint (sometimes communicating with the latter) (Fig. 4) are left undrained by lateral incisions in the anterior part of the synovial cavity. Similarly, the bursa under the inner head of the gastrocnemius, which so frequently communicates with the joint (Fig. 3), is left undisturbed. We have seen a few cases in which the suprapatellar portion, or even the whole of the anterior part of the joint, has become shut off from the main cavity. In these, no doubt, anterior drainage might be sufficient, but such cases are rare. Attempts have been made to drain the pouches behind the femoral condyles by introducing tubes through incisions in the capsule posteriorly. The latter is, however, so closely applied to the articular surfaces (Figs. 3, 4) that the tubes cannot be made to penetrate for any distance into the joint.

At any rate, the attempts made in this direction have failed. We have watched the career of patients treated by tubes placed in every conceivable corner of the joint. The results in those that have escaped with their lives

have been a stiff, swollen, painful limb, with sinuses discharging for weeks or months. We cannot believe that the final results, should the limb ultimately be saved, will compare at all favourably with those following a successful excision. Some of these joints that have healed up after a long and tedious convalescence have again lighted up after some slight movement or some attempt on the part of the surgeon to remedy deformity. This is probably due to the presence of residual septic material which lies dormant in some of the pockets referred to above.

In some quarters it has been the custom in bad cases of infection to turn back the patella, divide the lateral and cruciate ligaments, remove the semilunar fibro-cartilages and acutely flex the joint. When sepsis has been controlled—a process which may take six weeks or longer—the limb is straightened out, or a late excision is performed. The flexed position is extremely irksome for the patient, and it is difficult to arrange proper splinting to keep the parts at rest. Besides, this method fails fully to expose and drain the posterior part of the joint. The control of sepsis may take weeks to accomplish, and at the end of that time extension of the limb or excision may wake up the recently allayed infection. If excision is not done, the articular cartilages must be shed or removed if a firmly ankylosed knee is to be obtained. In addition to this, the intercondyloid and other recesses will probably be filled with granulation tissue, which must organize into badly-nourished scar tissue, in the meshes of which one may imagine imprisoned nests of infective

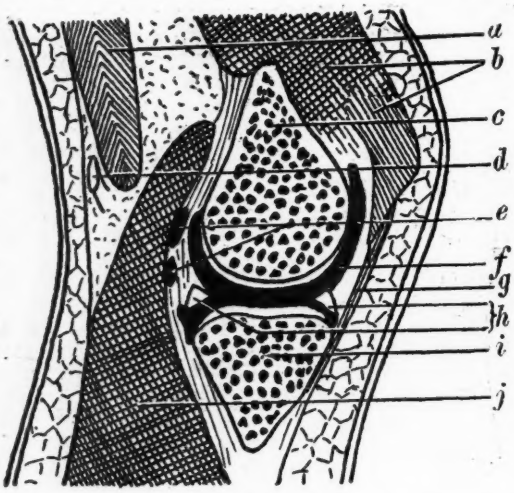

FIG. 3.—Vertical antero-posterior section passing through inner condyle. *a*, Semimembranosus muscle; *b*, quadriceps muscle; *c*, inner condyle of femur; *d*, tendon of semitendinosus muscle; *e*, bursa under gastrocnemius; *f*, cavity of joint; *g*, patellar ligament; *h*, internal semilunar cartilage; *i*, tibia; *j*, inner head of gastrocnemius muscle.

material ready to declare their presence on the slightest provocation.

EXCISION WITH WIDE SEPARATION.

For the past six months or so in the hospitals of the base to which I am attached as consultant I have been advocating excision of the bones with wide separation of the ends as a method of dealing with certain knee-joints in which conservative methods have failed. This procedure is carried out for the purpose of drainage, even if the bone ends have not been injured.

The operation is conducted as follows:

Lateral incisions are carried from above down, commencing two inches or more above the level of the upper border of the patella, and extending to the level of the tubercle of the tibia. These incisions are made far back so as to be on the same plane as the posterior ligament. They are joined at the level of the tubercle of the tibia by one which severs the ligamentum patellae. The flap thus included is turned back. The condyles of the femur are removed just above their cartilaginous surfaces, and a thin strip, removing the articular cartilage, is taken from the upper end of the tibia. The total length of bone removed is just under two inches. The finger explores the posterior surface of the space left, and the communication with the bursa under the inner head of the gastrocnemius (Fig. 3) is opened up or the bursa removed altogether. The popliteus extension of the synovial membrane is cut across with the tendon, but is not further interfered with. If an attempt is made to dissect this further, the superior tibio-fibular joint may be opened and infected (Fig. 4). The open end of the sheath may be left to drain. In some of our cases the suprapatellar extension with the bursa in continuation of it (Fig. 2) has been removed. I am not sure whether this is desirable, as by doing so the fascial planes of the thigh may be opened up and infected. Further experience is required on this point. The suprapatellar pouch (Fig. 2) can be drained much better if the patella is removed, and this is always done.

The limb is placed on a Thomas's knee splint, and wide separation of the sawn ends of the bones is obtained (Fig. 5) by fixed extension in the manner suggested by Lieutenant-Colonel Robert Jones, of Liverpool, for fractured femur. A few stitches anchor the flap at the lower end, but the lateral margins are left open for drainage. Slings attached to the bars of the splint support the inferior surface of the calf and thigh, and maintain the proper alignment. The suprapatellar pouch and the cavity left between the bones may be packed around Carrel's tubes or drained in the ordinary way. Subsequent treatment is on the same lines as that of compound fracture of the femur.

The ends of the bones must not be allowed to approximate until sepsis has been completely controlled, and then very gradually.

If attention is not paid to this point, recrudescence of

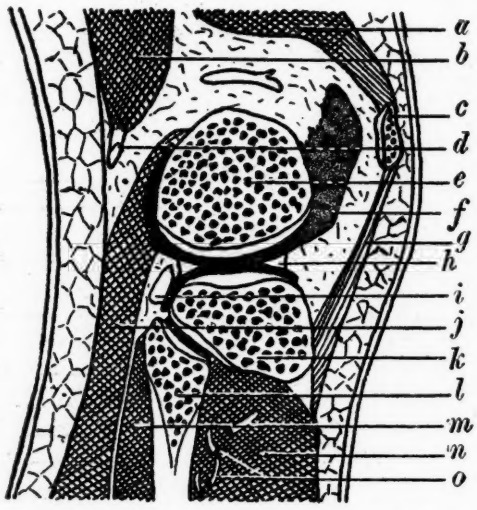

FIG. 4.—Vertical antero posterior section passing through outer condyle. *a*, Quadriceps muscle; *b*, biceps muscle; *c*, patella; *d*, peroneal nerve; *e*, femur; *f*, joint cavity; *g*, patellar ligament; *h*, external semilunar cartilage; *i*, tendon of popliteus; *j*, gastrocnemius muscle; *k*, tibia; *l*, fibula; *m*, soleus muscle; *n*, tibialis anticus muscle; *o*, anterior tibial vessels.

sepsis is very liable to occur, and the advantages of the operation will disappear. It is hoped that the thin layer of granulation tissue which forms over the ends of the bones will in time be converted into firm osseous tissue. Should firm union fail to take place, it would be a simple matter, when all the wounds have healed, and there is no longer danger of stirring up latent infection, to trim the bone ends and bring them together as in the ordinary excision of civil practice.

Advantages of Operation with Wide Separation.

Let us now consider what we have accomplished by this operation.

1. All obstacles to drainage have been removed. The pouches in the intercondyloid fossa, the extensions under the semilunar cartilages, the pouches behind the condyles, the bursa under the inner head of the gastrocnemius and the extension of the synovial membrane along the popliteus tendon have all been dealt with by one sweep (Figs. 1, 2, 3 and 4). In fact, every pocket has been removed except the suprapatellar extension, and this must be thoroughly opened up and drained.

2. We are now dealing with what is, in effect, a compound fracture with broad bony surfaces, without comminution, easily replaced in position when desired, without laceration of muscle, and with the best possible drainage.

The posterior ligament acts as a barrier against pus tracking into the popliteal space and the position of the lateral incisions allows of fluid being drained off at the lowest level of the cavity.

3. The risk of residual pockets remaining after ankylosis is reduced to a minimum.

4. It is an advantage with a stiff knee that the leg should be shorter than its fellow of the opposite side. This allows the foot to swing free of the ground in walking without the toes hitching with every step. In an ordinary case the shortening is just under two inches and part of this can be restored, if necessary, by raising the heel of the boot on the affected side. A little shortening is, as I have said, an advantage.

Objections to the Operation.

I have pointed out some of the advantages of the operation. It is necessary now to meet, on the other hand, some of the objections that have been urged against it.

1. *Shock.*—I am not satisfied that the shock of excision in capable hands is more than that of an amputation through the thigh. We have in some cases completed the operation in half an hour. No great nerves are cut, and bleeding from the soft parts is comparatively easy to control. Access to the ends of the bones for removal by the saw is facilitated by the extensive flap. If amputation is to follow, through failure of excision to control the sepsis, the risks are, of course, greater to the patient. The possibility of this increased risk is a matter for careful consideration in deciding on excision in the first instance.

2. *Oozing from the Sawn Surfaces of the Bones.*—This has occurred in two or three cases only, to my knowledge, and can, I feel certain, be controlled by packing. I have not yet dared to use aseptic wax to seal the bleeding points in the bone, for fear of damming back exudation which may be septic, but this is a method to be thought of should oozing be troublesome and confined to one or two points.

3. *Exposure of Freshly-sawn Ends of Bone to Infection.*—This is a theoretical objection which does not hold good in practice. The section is clean, the bone is not comminuted or badly bruised, and drainage is so good that retention is unlikely to occur. Osteomyelitis, starting from the cut surfaces, has not been a feature in our cases.

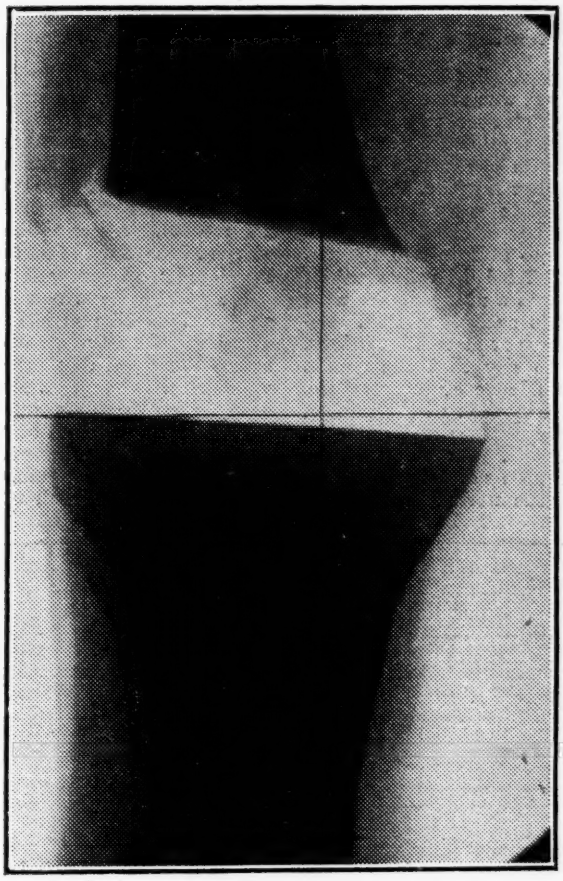

FIG. 5.—Skiagram showing the amount of bone removed, and the position in which the ends of the bones should be maintained until sepsis is controlled. The section of the femur is a little too oblique.

4. *Protracted Convalescence.*—It will be admitted at once that greater demands will be made on the patient's resources after excision than after amputation. The earlier days or weeks of his convalescence will be attended with some anxiety and trouble, and it may be six months or more before he is able to move about by himself without mechanical support. A judicial survey of all the circumstances connected with the patient's state of health, his social position, and his employment after the war, will help to guide the surgeon as to what effect the objections under this and the following heading should have upon his course of action. If he is in doubt of the ability of the patient to stand the strain of the greater demands that will undoubtedly be made on his reserve of strength by excision, he ought to amputate rather than excise. The patient, not his leg, must be given the benefit of the doubt.

5. *Stiff Knee-joint.*—The high state of perfection to which artificial limbs have been brought has given rise to the opinion in some minds that a light, comfortable, efficient, and well-shaped artificial limb, with a movable knee-joint, is preferable to a stiff leg. It must be admitted that a patient with such may pass muster as a sound man. There is, however, always the sentimental objection, and few patients, if given their choice, would choose the mechanical device, however perfect, in preference to their own leg, even with a stiff knee-joint. Artificial limbs must always remain complicated and liable to get out of order, necessitating the attention of an instrument maker who may be continents away, and unless the patient has the good fortune to possess a spare one, he may have to go without during the time his artificial limb is in the repair shop. Very few men in humble circumstances will be able to afford the luxury of a succession of highly complicated appliances, and while public funds for such may be available during the excitement of war and for some time after, it is not unlikely that the final successor of the shapely artificial limb may be the less pretentious pin and bucket. It is wonderful how little real disability a stiff knee gives rise to after the patient gets used to it.

RESULTS.

It is too early yet to speak of the final results. We are concerned in the meantime with the problem of combating sepsis and saving life. Whether the final results will repay the trouble spent in saving the leg remains to be seen. We have done over sixty cases at this base and have only had news of the fate of a very few. The first case done on these lines was under the care of Captain McDonnell at a base hospital. The patient was wounded on March 18th, 1916, by a rifle bullet which entered posteriorly through the popliteal space on the right side, and lodged in the femur at the intercondyloid fossa. *X* ray showed fracture of the internal condyle. The entrance wound was septic when I saw him on the 20th. The joint was distended, tense, and painful. Pulse 88; temperature 101.4°. There was no injury to the great vessels and nerves in the popliteal space. A large flap was turned up in order to examine fully the damage inflicted. The bullet was found deeply embedded in the intercondyloid notch, with some comminution at the point of impact, and a transverse fracture separated the internal condyle from the rest of the bone. The cruciate ligaments were torn, and the joint was filled with blood clot. Having regard to the obvious sepsis, the comminution of the femur, and the injury to the cruciate ligaments, we decided that the chances of the patient having a movable joint, even if he escaped a violent septic arthritis, were very slight. We discussed the question of amputation, but finally determined to try excision with wide separation of the bones for drainage. This was immediately carried out. The temperature rose to 102.4° on the evening following the operation, and fluctuated between 99° in the morning and 101° in the evening for seven days, after which it ranged from about 100° in the evening to normal in the morning for another seven days. On two occasions subsequently he had flares of temperature lasting for several days at a time. The temperature reached 104° F. on the first

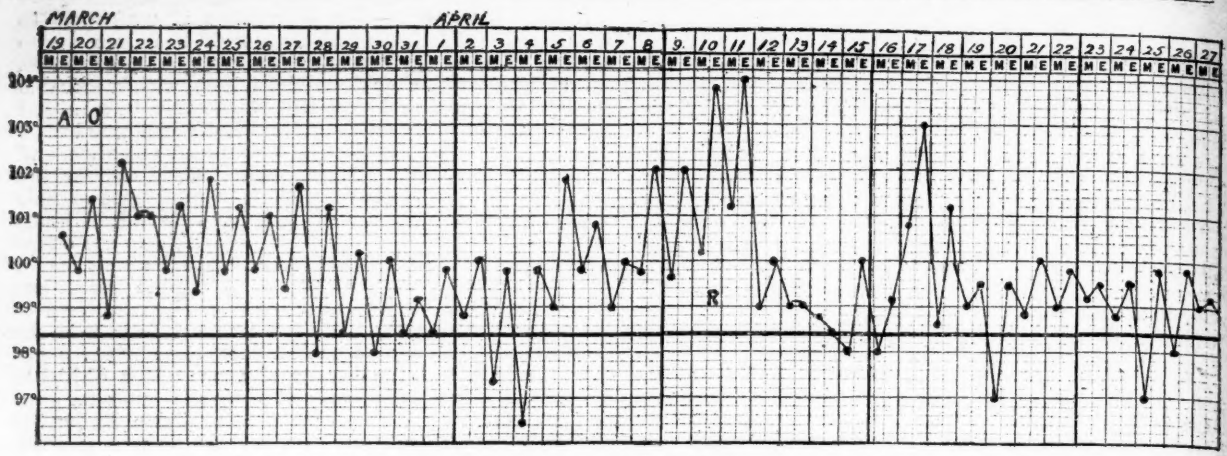

CHART 1.—Comminution of femur. Excision of knee on third day after injury. A, Admission; O, operation; R, rigor.

occasion and 103° in the succeeding attack (Chart 1). The patient's general condition, however, was so good and the wounds looked so healthy that we felt sure this temperature was due to some other cause (possibly "trench fever"). We held on, therefore, with our efforts to save the leg, and the case gave no further anxiety. The ends of his bones were gradually allowed to approximate. He was evacuated to England about six weeks after his injury in excellent condition with his limb still in a Thomas's splint. Captain McDonnell heard from him five weeks later, when he reported that he was walking about with a support on his leg and his wounds entirely healed. We have operated on cases up to ten days or more after injury. It will suffice at the moment to say that the results as regards cessation of pain, subsidence of temperature, and improvement in the general condition of the patient have been encouraging. The temperature and pulse do not come down at once, as a rule. As in the case mentioned, a week or ten days or more may elapse before the evening temperature touches the normal line, but as long as the general condition of the patient remains satisfactory we are content to wait. We are, however, always ready to intervene further should untoward symptoms occur, such as rise of pulse and temperature, and before anaemia, wasting and anorexia show that the patient is finding it impossible to cope with his infection. It is well to be prepared for the gradual settling of the temperature and not to expect too much all at once.

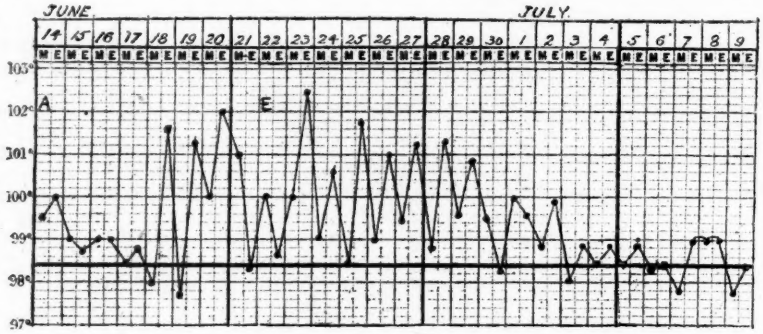

CHART 2.—Penetrating wound of joint; no fracture; no foreign body retained. Excision of knee for increasing sepsis, oedema of leg and thigh, and rising pulse-rate, on tenth day after admission. A, Admission; E, excision of knee.

The patient's general condition is a better guide than the swing of his temperature, provided the latter is within reasonable limits. Excision of the knee with bone injury is carried out exactly as I have described for sepsis, but it is essential to get well beyond the comminution. Several inches may be removed in the hope that the surgeon who finally has charge of the patient at home may be able to graft bone when all sepsis has ceased. This may be necessary to give the patient a limb of serviceable length. If joints with badly comminuted bone ends are seen early, before sepsis has had time to develop, it may be possible to allow the bone ends to come together at once, as in the ordinary excision of civil practice.

STATISTICS.

Statistics which deal with cases which have not been traced to their final termination must be regarded as unsatisfactory. On the other hand, it is desirable that the immediate risks and results of a major operation, such as excision of the knee, should be placed before those who may be called upon to perform these operations. As I have stated, the ultimate results of our cases are not at present available. It may be that cases of excision which we have considered safe as regards limb and life on evacuation have subsequently belied our hopes. Time will tell. For the information of those who are not working in France it may be stated that our cases are not evacuated until sepsis has been controlled and danger to life averted. We have endeavoured to keep our excisions of the knee until the temperature has become normal and the limb is apparently safe.

In the area to which I am attached we have carried out the operation on the lines indicated in this paper in 64 cases. Twenty-two of these were operated on on or before the third day, for shattering of bone combined in all cases with septic wounds into the joint. There have been no amputations and no deaths in this series. The remaining 42 cases, all of which were septic, were operated on between the third and twenty-fifth day. Two died after the operation. One, operated on seven days after his injury, died from shock and oozing from the cut surfaces of the bones. The second case had an incomplete excision carried out at a clearing station within twenty-four hours of his injury. When he reached the base he was doing well. His temperature shot up later, however, and the excision was completed on the twelfth day by removing more of the comminuted femur and the cartilaginous surface of the upper end of the tibia, which had been left at the first operation. He died from septic infarcts in the lungs a few days later. Thirteen cases required amputation owing to failure of the excision to control sepsis, and of these four died. In the cases that died the excision was carried out on the tenth, twelfth (two cases), and twentieth day respectively. The last case was a boy who had already had one leg amputated, and, against our better judgement, we yielded to his demand that amputation of the remaining one should not be performed. Major West did what we considered the next best thing, but the operation failed, and a subsequent amputation, as a last resort, did not succeed in saving his life. In the other three cases pus had, at the time of the excision, begun to track in the thigh or leg, and this we now believe to be a contraindication to the operation.

It will thus appear that the total mortality was six cases out of a grand total of sixty-four. Two of these followed excision alone, and four occurred after a subsequent amputation. From a study of these statistics, incomplete as they are, one can form a fair estimate of the risks of the operation. It must be remembered that a patient who will not submit to an amputation will, even

when the additional risk is explained to him, submit to an operation which gives him a fair prospect of retaining his leg, even with a stiff knee. Fifty cases reached the stage of apparent safety as regards limb and life. Most of these have been evacuated to England, and the remainder are about to be transferred. Those operated on within a few days of the dispatch of this paper are not included, as they are obviously useless for statistical purposes.

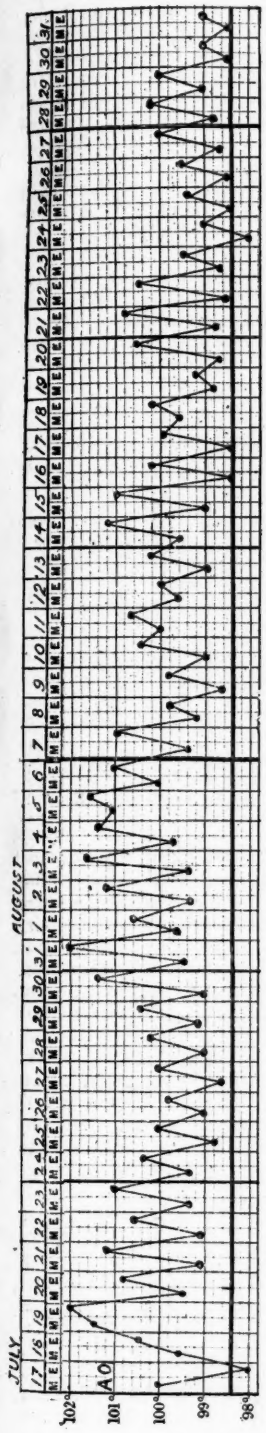

CHART 3.—Septic wound into joint; shell fragment embedded in internal condyle; comminution. Excision of knee on third day. Ends of bones now in position and union proceeding. A, Admission; O, operation.

As might be expected, the results of the operation vary in the hands of different surgeons, chiefly, I think, owing to the selection of cases. One officer, for instance, reports from his hospital twelve cases, six operated on on or before the third day for shattered bone, and six between the seventh and eleventh days for sepsis after failure of the closed method. There have been no deaths in this series, and no amputations while the patients have been in France. One case had amputation performed the day following his arrival in England.

If these statistics can be considered as proving anything they demonstrate first, that cases with shattering of the femoral condyles or upper end of the tibia, or both, if suitable, can be operated on by this method with practically no risk if dealt with within three days of the receipt of the injury; and secondly, that cases operated on for sepsis are likely to show good results if dealt with early, say within seven days. After this period, the prospects of saving the limb are less hopeful and the danger to life more serious.

While searching out these statistics I have seen several *x*-ray photographs showing the results of treatment. Bony union appears to have occurred in some instances after a period of ten weeks or thereabouts. In some, it appears that lateral shifting of the tibia on the femur has occurred. This can be prevented by suitable measures, if recognized before union is complete. During convalescence, therefore, it would be well occasionally to ascertain the relative position of the bone ends, and rectify malposition while the bond of union is soft.

Indications.

A great deal of judgement will be required to select cases for excision. It may be stated at once that the patient's life must not be unduly risked in the attempt to secure to him what is after all a somewhat disabled limb. It is difficult on paper to give reliable indications, but I will mention a few guiding principles that have been helpful to us. The reader must understand, however, that general impressions of the patient's condition, which can only be gained by experience of a large number of cases, must be the ultimate guide. Let us take a case. A patient is brought to the base with a punctured wound

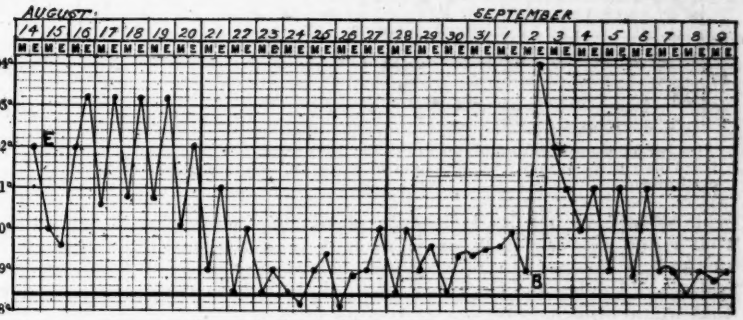

CHART 4.—Comminution of both condyles of femur and fracture of patella; large lacerated wound into joint; softs parts and bone filthy. Excision of knee on third day after injury. E, Excision; B, bronchitis.

of his knee-joint and a retained fragment of shell with or without injury to the bone. Let us assume that the wound is excised with the greatest care, the fragment removed, the joint cleansed, its contents set aside for culture, the synovial membrane accurately stitched, and the soft parts overlying either sutured up or a drain inserted down to but not into the joint. A splint is applied and the result awaited. The joint fills up again. Aspiration is performed, and micro-organisms, let us say streptococci, are found. The joint may be irrigated and again sealed, after perhaps the introduction of ether, or formalin and glycerine. Phagocytosis is perhaps found to be deficient. Again the joint fills up, and becomes hot and tense. The same procedure as before is repeated, until it becomes evident that improvement is unlikely to take place and the patient begins to show the effect of his infection in his general condition. His temperature rises

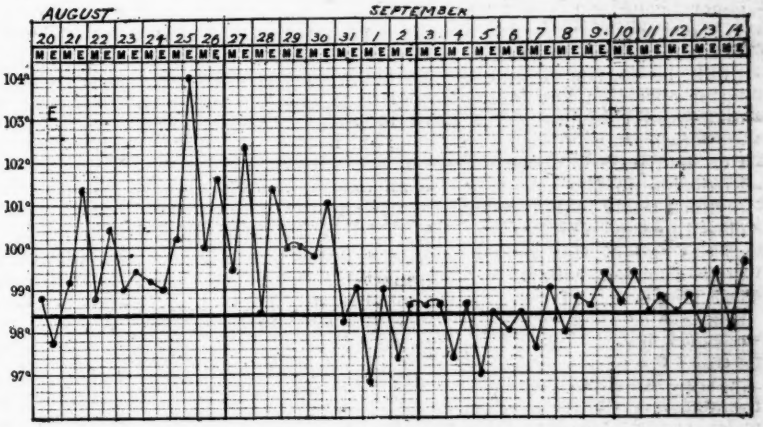

CHART 5.—Comminution of both condyles of femur and of head of tibia. Excision of knee on third day after injury. E, Excision.

and his pulse increases in frequency. Oedema of the lower part of the thigh and upper part of the leg begins to appear. Obviously something more must be done. It is at this stage that attempts to drain the joint have been made by incising freely on either side of the patella and inserting tubes here and into the suprapatellar pouch.

As I have already said, our experience of these attempts has been very unfortunate, and often, after a few days, we have been driven to the last extremity—namely, amputation—to save life. I wonder how many movable joints have been obtained by this method of drainage as adopted in this war. Of the many cases I have seen so treated in France I cannot call to mind a single satisfactory case—

that is, one that gave any promise of a freely movable efficient joint. It is to replace this system of drainage that I suggest that excision of the ends of the bones with wide separation has its legitimate place. If done early, that is, as soon as it becomes evident that the closed method is doomed to failure, and before any marked oedema of the leg and thigh has set in, limbs will be saved that would otherwise inevitably require amputation. If a policy of waiting is adopted, the risks of the procedure are much increased. If the patient has a good colour, if his appetite remains good, if he is not wasting, if his pulse though rapid is of good tension, if he is cheerful and his condition as a whole fairly satisfactory, excision ought, in my opinion, to be considered, provided always that pus has not broken through the synovial membrane and tracked in the fascial planes of the thigh or leg. If, on the other hand, he is anaemic, if he has lost much flesh, if his appetite is poor, if he is restless and sleepless, if his tongue tends to be dry, if his pulse is rapid and flapping in character, and his condition as a whole gives rise to anxiety, it would be tempting Providence to do anything short of amputation.

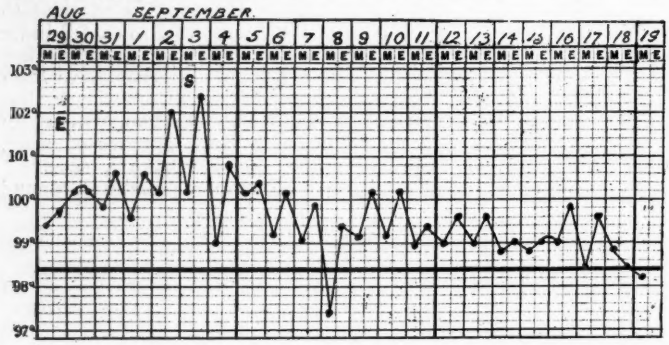

CHART 6.—Comminution of head of tibia; dirty wound. Excision of joint third day after injury. E, Excision of knee; S, splint changed under chloroform.

If pus has begun to track in the thigh or leg, excision will probably fail and a subsequent amputation will very likely be required.

If the patient is struggling with other severe wounds, excision is, I think, contraindicated unless his general condition is very good indeed.

If one compares the condition of a patient who has been drained in the old way with one after excision he will, I think, be convinced that the morbidity is less after the latter operation, and that the relief of pain is more immediate and complete. We have in some cases had to amputate after excision had failed, but in these the operation had probably been done too late. It is a nice point to decide on the best time for an excision, but we are inclined lately to do it early. In other words, we give the closed method a chance for a few days. If the joint is not at the end of this time beginning to settle down, immediate excision will, I feel sure, save amputation in a fair proportion of cases. In fulminating cases amputation rather than excision will be required to save the patient's life.

It will be gathered that excision is here recommended as an alternative to drainage by the older methods, and to amputation. If the surgeon is satisfied that a less radical measure than amputation will suffice in a case in which the closed method has failed, he will be the more inclined to operate early, and the statistics of excision will improve accordingly.

The accompanying charts will give some idea of the course of the temperature after successful excision.

I am indebted to Captain McDonnell for Charts 1, 2, and 4, to Captain Whittington for Chart 3, to Captain Lock for Chart 5, to Captain Edye for Chart 6, and to Captain Palmer for Chart 7.

Adjustment of Splint.

I have been asked to add a few words on the splint and its management. All our cases have been treated with a Thomas's knee splint. The junctions between the bars and the ring ought to be so welded or brazed that no irregularity is left which might project through the padding and cause intolerable pressure over the ischial tuberosity. The ring must be firmly padded, and should not be too wide or too thick. If too wide, it will be impossible to keep it in contact with the ischial tuberosity, from which, and not from the perineum, the bearing must be taken. Sizes from 22 to 25 inches in circumference will be found the most suitable. If too thick a ring is used, a firm bearing will be impossible to obtain. Considerable traction will be required to overcome spasm and keep the bones apart. In order to maintain this, the extension straps should be inspected daily, and any slipping or loosening adjusted. A rise of temperature or pulse will often indicate that the traction is insufficient to keep the bones far enough apart to provide free drainage between the ends. In Chart 6, the temperature did not begin to settle until comfortable adjustment and sufficient traction had been obtained. Painful spasm is an indication that either the splint is unsuitable, or has not been properly applied.

There is one other practical point. As we have been making our lateral incisions further and further back in order to secure satisfactory drainage of the cavity between the bones, it has become increasingly difficult to drain the proximal portion of the suprapatellar space, whether the synovial membrane has been removed or not. To meet this, it has been necessary in some cases to make a median incision at the extreme upper limit of the space in question and insert a tube so as to ensure that no pocketing shall take place. Sir Almroth Wright's most recent irrigating apparatus, "the Boulogne rose irrigator," which is now available, and can be obtained from the Base Medical Stores in France, might be of great service in these cases.

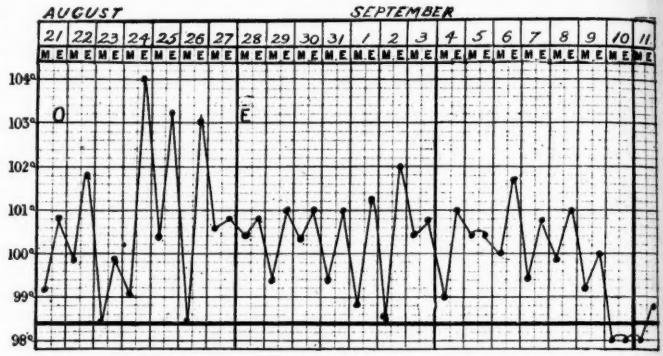

CHART 7.—Operation by "closed" method on second day after injury; shell fragment removed. No bone injury. Excision of joint six days later owing to failure of first operation. O, First operation; E, second operation, excision of knee.

I desire to express my sincere thanks to the officers who have kindly placed their statistics at my disposal. I am also indebted to Professor Symington, F.R.S., and Mr. R. Hunter, of Queen's University, Belfast, for the drawings which illustrate the text, and to Captain Gamlin, R.A.M.C., for the *x*-ray photograph.

REFERENCE.

[1] *British Journal of Surgery*, vol. iv, No. 13, 1916.

GUNSHOT INJURIES TO THE KNEE-JOINT:

SOME SUGGESTIONS WITH REGARD TO THEIR TREATMENT.

BY

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AND

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OF the injuries met with at base hospitals, gunshot wounds involving the knee-joint are, perhaps, the most troublesome to deal with, and there is as yet no consensus of opinion as to the most satisfactory methods of treatment. It is still held by some surgeons, of considerable experience in this class of injury, that such wounds may be roughly divided into two main groups: (*a*) Those which get well without interference; (*b*) those which are better amputated.

Whilst we do not claim that the treatment outlined here is original, or an improvement on methods adopted elsewhere, yet, in our hands, it has proved highly successful, and has been based on considerable experience, and not a few disappointments.

It must be remembered that the cases, on the average, do not reach us until forty-eight hours after injury. During that time they have passed through a casualty clearing station, where they are cleaned up and splinted, before being evacuated to the base. In many cases wounds have been excised under anaesthetics, and joints injected with some antiseptic preparation.

Our system of treatment is based almost entirely on the pathological report as to the nature of the fluid in the joint, and on the *x*-ray report. We find that little reliance can be placed on temperature, pulse, or degree of pain, which factors are materially influenced by the mental stress and fatigue which the patient has recently undergone.

The infections we have met with in cases of wounds of the knee-joint have been caused by one or other of the following organisms:

(*a*) *Mild.*—Enterococcus.
(*b*) *Moderate.*—*Streptococcus brevis*; Staphylococcus; *Bacillus coli*; *Bacillus aërogenes capsulatus* of Welch (*B. perfringens*).
(*c*) *Severe.*—*Streptococcus longus.*

Experience has shown us that some infections are more difficult to combat than others, and since the prognosis and treatment depend on the virulency of the infecting organism, we have classified them accordingly.

We recognize five main types of joint injury: (1) Aseptic and without fracture; (2) mild or moderate sepsis and without fracture; (3) acutely septic and without fracture; (4) aseptic with fracture; (5) acutely septic with fracture.

1. Aseptic without Fracture.

The whole limb is shaved and cleaned, the area of operation being prepared with petrol and iodine. The wound is excised should this be advisable, but we do not recommend it in small wounds in which there is little damage to the tissues; each case must be judged on its merits. The excision is carried down to the synovial membrane, but the latter is not disturbed.

Foreign Bodies.

(*a*) *None Present.*—In this case nothing further is done, unless the joint be unduly distended, when we aspirate, thereafter injecting two drachms of glycerine and formalin.

(*b*) *Small Foreign Bodies.*—These may be left, the treatment being similar to the case in which there is no foreign body, but it is necessary to keep the joint under careful observation.

(*c*) *Large Foreign Bodies.* — Unbroken bullets and shrapnel balls are invariably removed, as we are of opinion that they may become a source of infection at a later date. We prefer to remove such missiles through a counter incision, rather than extract them through the wound of entrance, since even after a most careful excision of the track one cannot be certain that no infected material is left. The joint is then irrigated with normal saline, the wound sutured, and finally 2 drachms of glycerine and formalin preparation injected. Thereafter, in all cases, the joint is immobilized on a splint in a position of slight flexion.

Case I.

Pte. L., wounded February 1st, 1916, by a rifle bullet in left knee-joint. Dry dressing applied at field ambulance. Re-dressed and limb immobilized on splint at casualty clearing station. Admitted here on February 3rd. There was a small entrance wound immediately internal to the tendon of the biceps. No exit wound. Joint tense and painful. Temperature 99.2° and pulse 84.

The joint was aspirated and found to contain blood-stained fluid, which the pathologist reported sterile. A skiagram showed an unbroken bullet lying slightly above and to inner side of patella, free within the knee-joint cavity.

Under an anaesthetic, after preparation, the wound edges were excised. An incision 1½ in. in length was made over the inner margin of the patella, the synovial membrane opened, and the bullet removed. The joint was then irrigated with normal saline and the incision sutured. Two drachms of glycerine and formalin were injected. The limb was immobilized in a slightly flexed position on a Neville's splint.

On February 4th the temperature rose to 100°, pulse 98. Joint tense and painful. On the following day the pain was less, but swelling remained the same. The patient made an uninterrupted recovery. On February 21st the splint was removed. Joint movement was free. A plaster-of-Paris splint was then applied, preparatory to the patient's evacuation to England.

Case II.

Lance-Cpl. C., wounded April 6th, 1916. Admitted here on April 8th. There was a penetrating wound of right knee-joint; entrance at inner border of patella. Knee tense and painful. Skiagraph showed small shell fragment lying free within the joint cavity, midway between the condyles of the femur. Knee-joint aspirated, and 1 oz. of a serous fluid withdrawn; this relieved the pain somewhat. Temperature 99.4°.

On April 11th knee-joint again aspirated, and 2 oz. of turbid yellow fluid withdrawn. Temperature 101.4°. The pathologist reported: "Fluid from knee-joint on April 8th, and also on April 11th, does not show any sign of the presence of organisms. Two cultures of both specimens are sterile. There are large numbers of pus cells present, and a small deposit of pus settles to the bottom of the tube. The condition is probably either traumatic or there is an infective focus shut off from the general joint cavity."

On April 13th the swelling and pain were less. Temperature 102.2°. From this date the temperature gradually subsided, and after April 16th remained normal. The swelling gradually decreased.

On April 22nd the patient was discharged to England.

2. Mild or Moderate Sepsis without Fracture.

In this class of case there is every prospect of the joint recovering its full function. Treatment is accordingly directed to this.

The operation is carried out on the same lines as in the previous class, with the addition that counter incisions into the joint are made on either side of the upper part of the patella. These incisions are made as small as possible, but large enough to admit a rubber tube ¼ inch in diameter. Before the tubes are inserted the joint is thoroughly irrigated with normal saline solution. The tubes are inserted just through the opening in the synovial membrane and are anchored in position by a skin suture. The ends of the tubes are left long enough to project through a light dressing, but they must be covered by a moist pad of gauze. The limb is fixed, slightly flexed, in a Thomas knee splint, and light extension applied. Into one of the tubes one drachm of 0.5 per cent. eusol is injected hourly; the other acts as a drain. After the third day the injection is given every four hours. The tubes are generally removed on the sixth day. After this dry dressings are used until the incisions heal.

Case III.

Pte. H., wounded July 7th, 1916. Admitted July 9th. Patient had multiple shell wounds over limb and trunk. The left thigh seriously infected, and numerous small wounds in near proximity to right knee-joint.

On July 10th a skiagraph showed numerous small shell fragments near the right knee-joint, but none actually in the joint. Under an anaesthetic multiple incisions made in the left thigh for severe suppuration; right knee-joint aspirated, and found to contain a turbid but sterile fluid. Glycerine and formalin, 2 drachms, injected.

On July 18th knee-joint tense and painful; aspirated, and glycerine and formalin again injected; patient's general condition grave.

On July 21st thigh dressed under an anaesthetic; patient had oedema of both legs and thighs; the knee-joint appeared to be improving.

On July 31st the knee-joint, which appeared to have quietened down, was again swollen and painful; knee aspirated, and 2 oz. of thick but non-offensive pus withdrawn.

On August 2nd patient's general condition slightly improved. Pathologist reported fluid from knee-joint to be infected with enterococcus and *Streptococcus brevis*. Under an anaesthetic two lateral incisions made into joint cavity, which was then irrigated with eusol, and two ¼ in. rubber tubes introduced. Limb put up slightly flexed on a Thomas splint.

August 4th: Since operation 1 drachm of 0.5 per cent. eusol was injected into one tube every four hours. There was a slight discharge; pain slight, and joint not excessively tense.

On August 8th there was still some swelling of joint and discharge; tubes changed.

On August 12th the knee was doing well; tubes removed; dry dressing; Thomas splint removed, and back splint applied.

On August 20th the knee seemed to have quietened down; back splint removed.

On August 24th the knee was healed; general condition good; slight movement of knee without pain. Patient discharged to England.

3. Acute Sepsis without Fracture.

The virulency of the organisms in this class of case is such that free drainage is called for. Should drainage be inadequate the infection will spread up and down the limb far beyond the confines of the knee-joint cavity in a remarkably brief period. The surgeon is then confronted with the necessity for amputation under most unfavourable

conditions. Whilst we recognize that perfect drainage of the knee-joint can only be obtained by laying open the joint by an anterior incision dividing the ligamentum patellae and crucial ligaments, yet such treatment is so drastic that we have, after many trials, devised another method, which gives good and adequate drainage, and is an improvement, inasmuch as the great anterior ligament of the joint, the ligamentum patellae, is undivided. Convalescence is greatly shortened, and the patient has the prospect of a useful limb.

The preliminary steps are as previously described, the wound being excised, swabbed with iodine, and packed with gauze. Two vertical incisions are made on either side of the ligamentum patellae close to its lateral margins. Each incision is 1½ in. in length, its centre being over the articulation. From the lower ends of these incisions further incisions are made at right angles, outwards in the case of the outer incision, inwards in the case of the inner incision, and extending for a like distance. These incisions are made down to the joint capsule. The flaps thus formed are turned up.

The joint capsule is now excised over as wide an area as possible, care being taken that the lateral ligaments are not cut. The next step is to remove the semilunar cartilages, together with the pad of fat which lies behind the ligamentum patellae. Free access can now be had to the posterior parts of the joint. The synovial reflections on either side of the patella are incised in their most dependent parts. The suprapatellar pouch is opened by lateral incisions 1 in. in length. The joint is now thoroughly irrigated with normal saline. The knee being fully flexed, small Carrel drainage tubes are introduced through the lowest incisions —one in each. They go between the joint surfaces, in the notch between the condyles, to the posterior part of the joint. Ordinary drainage tubes are introduced through all other incisions—they go no farther than the opening in the synovial membrane and are sutured to the skin. Finally the limb is fixed in a flexed position on a Thomas knee splint. Eusol is introduced every two hours through the small tubes, and in addition the joint is irrigated night and morning with eusol. The small tubes are removed on the fourth day, but irrigation through the other tubes is continued until all acute sepsis has disappeared—this is generally about the tenth day. The latter tubes are then removed under a general anaesthetic, and the leg is straightened and fixed in a Thomas splint.

CASE IV.

Pte. S., wounded August 8th, 1916. Treated at casualty clearing station, where he was found to have a wound of the left knee involving the joint, and two wounds of the left ankle. He was admitted on August 9th. His field card stated: "Foreign bodies removed from both wounds in ankle, but no foreign body found in knee. All wounds excised. It was impossible to get full extension of the knee." He had a wound immediately external to the lower edge of the patella. The joint was tense and very painful and held in a slightly flexed position. Temperature 101°, pulse 112. A skiagram showed shell fragment lying within the joint cavity. Fluid withdrawn from the joint contained enterococcus and *Streptococcus longus*.

Under an anaesthetic the wound in the knee was explored; it was found to have been excised down to the synovial membrane. The patella had been grazed by the projectile and some fibres of the ligamentum patellae severed. The wound was freely excised, and the capsule of the joint removed over as wide an area as possible. On the inner side of the ligament a V-shaped flap was turned up and the capsule opened. The foreign body was seen to be lying on the crucial ligament; it was removed. The semilunar cartilages and infrapatellar pad of fat was excised. The lateral synovial pouches were incised and drained; the suprapatellar pouch was incised on each side. Tubes were stitched into all these incisions; and, finally, two Carrel tubes were inserted through the lowest openings into the posterior part of the joint. The joint was thoroughly flushed with normal saline solution and a light gauze dressing applied, the limb being fixed in a Thomas splint under extension.

On August 13th the temperature had not risen above 99° since operation. The Carrel tubes had been injected, at first two-hourly but latterly four-hourly, with 2 drachms of 0.5 per cent. eusol, and the superficial gauze dressings changed twice daily; discharge now slight. The Carrel tubes were removed under an anaesthetic, and the limb fixed on a straight back splint without extension.

On August 16th the temperature was normal. All drainage tubes were removed; there was still slight discharge of synovial fluid from the wound. Dry gauze dressing to be changed every other day.

On August 24th the incisions were almost healed. Joint quiet; no pain. Discharged to England on back splint.

4. ASEPTIC WITH FRACTURE.

Under this heading there are two types of injury. In one case the missile traverses or penetrates the joint cavity, causing a fracture of one of the bones entering into the articulation. In the other case, the missile causes a fracture of bone in close proximity to the joint, and though the missile itself has not entered the joint, yet the fracture extends into it. In the former case the treatment coincides with that employed in Class 1.

In the latter case we have a fissured fracture in close proximity to, and extending into, the joint. The effusion, at first aseptic, rapidly becomes infected by direct extension from the wound.

In many cases the missile is embedded in the bone, and with it are numerous infected foci. Such a wound is freely excised, detached portions of bone are removed along with the missile, and the track is thoroughly cleansed and scraped. A salt pack is the ideal dressing, provided one can be sure that it is in contact with all parts, otherwise we use continuous eusol irrigation.

CASE V.

Pte. L., wounded on August 20th, 1916. Admitted on August 21st. He had a small wound on entrance over the inner side of the head of the left tibia. Knee-joint swollen, tender, and painful. Temperature 100.8°, pulse 96.

Skiagraph shows a shrapnel ball lying embedded in the head of the tibia with a fracture extending into the joint. Joint aspirated and a blood-stained fluid withdrawn, which the pathologist reported to be sterile.

Under an anaesthetic the wound was freely excised; the shrapnel ball with portions of clothing was removed, and the wound in the bone gouged. The cavity in the bone was packed with a salt bag, and finally 2 drachms of glycerine and formalin were injected into the joint.

On August 23rd the temperature rose to 102° and pulse to 118. The joint was painful.

On August 24th the pain was less; temperature 101°, pulse 110.

On August 25th the temperature was normal, pulse 90; pain less. Wound re-dressed with salt pack.

On August 30th the swelling in joint had subsided; temperature normal since August 25th; no pain; wound healing well. Discharged to England.

5. ACUTE OR MODERATE SEPSIS WITH SEVERE FRACTURE.

This class of case, unfortunately common, is too frequently temporized with till amputation is inevitable. It is almost invariably associated with extensive comminution of one or more bones entering into the articulation. Many are of opinion that amputation should be performed in these cases, but we think that, should the fracture not extend further than 1 in. above the articular surface of the femur or below the level of the tubercle of the tibia, the limb can be saved, and we consider it worth while, even at the expense of a permanently fixed knee and a certain amount of shortening.

Our treatment, in brief, amounts to an excision of the joint, but modified, so that the septic nature of the wound can be efficiently dealt with.

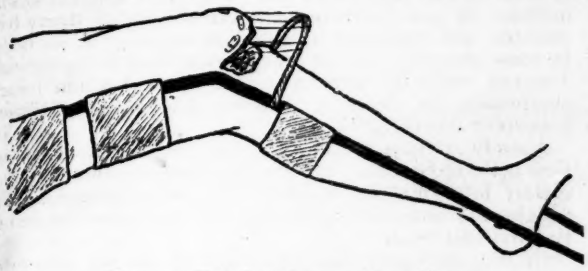
The knee-joint is opened by curved incision over the front, dividing the ligamentum patellae and lateral ligaments, a flap being thrown up which includes the patella and all superficial tissues. The knee-joint is fully flexed, the crucial ligaments divided, semilunar cartilages, tags of synovial membrane, and all necrotic tissues removed. The interior of the joint, being thus rapidly and freely exposed, is searched for any pockets of pus, which, if found, are freely laid open.

If one condyle of the femur is found to be shattered, both must now be removed. Similarly, should the head of the tibia be involved, it is excised. If either femur or tibia is intact it is left till a later date. The joint is now thoroughly irrigated with 0.5 per cent. eusol.

We have had considerable difficulty in preventing retraction of the patellar flap. To obviate this we have devised the following: Three aluminium plates, 1 in. long and ¼ in. broad, with one hole bored through them near each end, are used. These plates take up the tension of sutures passed through the flap near its edges. The sutures are tied to elastic bands which are supported by a metal arch fixed anteriorly on a Thomas splint (see figure).

Tubes are now inserted down to the posterior parts of the joint; these are packed round with salt bags. Gauze wrung out of hypertonic saline is laid over this, and a few turns of bandage loosely applied, to keep the gauze in position; the last foot of this bandage is left hanging from the limb to act as a drain.

Extension is applied to the leg and the limb suspended, on a bent Thomas knee splint, by 4-in. rubber slings. The back of the knee-joint is supported on a bent perforated zinc splint reinforced by aluminium strips, which is, in turn, suspended from the Thomas splint by rubber



Thomas splint adapted for excision of knee.

tubes above and below. The knee-joint is thus firmly supported in a slightly flexed position under extension, and moreover, in spite of continuous drainage and frequent dressings, the limb can be kept dry and comfortable.

The bed is so arranged that the discharge drains into a bucket placed below it. The wound dressings are kept moist by hypertonic saline solution being sprayed on them, and thus the bandage never acts as a plug.

The dressing is removed when indicated, a general anaesthetic being given, and a similar dressing applied.

Later, this dressing may be replaced by one of eusol irrigation twice daily.

This treatment is continued until the wound is clean. We then, under a general anaesthetic, remove the articular cartilage from the ends of the undamaged bone. The flap formed by the patella and superficial tissues, which has up till now been kept under extension, as previously described, is sutured in position, plates of aluminium being employed to give equal tension and prevent the sutures cutting through.

A thin piece of rubber is left in the posterior part of the wound to act as a drain.

Finally, the limb is put up straight on the Thomas splint with a ham splint posteriorly to support the knee.

CASE VI.

Pte. M., wounded by shell fragment on June 2nd, 1916. Admitted June 4th, 1916. The patient had a large lacerated wound on the inner side of the left knee-joint, with a smaller wound on outer side of thigh about four inches above the condyle. Wound very foul, with free discharge of pus and synovial fluid. Temperature 99°, pulse 108. Skiagraph showed a comminuted fracture of the internal condyle of the femur.

On June 5th, under an anaesthetic, wound edges trimmed and loose portions removed. The wound on outer side of thigh appeared to be the entrance wound, the projectile passing between the large vessels and the bone. Fluid taken from the joint, which the pathologist reported to contain enterococcus and streptococcus.

On June 7th temperature 102°, pulse 110; joint painful. Free discharge of pus from the wound.

On June 8th, under an anaesthetic, joint opened up by anterior incision. The interior severely infected, and in a sloughing condition. Internal condyle extensively comminuted. Both semilunar cartilages removed and crucial ligaments divided, the lower ends of the femur then excised immediately above the condyles. All tags of synovial membrane and sloughing tissues removed. The limb was fixed in a flexed position on a Thomas knee splint, the wound packed with salt bags, and patella flap extended.

June 12th. The wound had discharged freely for the past three days. Temperature 99°, pulse 110. Dressing changed under an anaesthetic, wound cleaning up well and sloughs beginning to separate. The patient has a bromide mixture, with morphine when necessary.

June 16th. Wound dressed without anaesthetic. The dressing came away easily with little pain. Eusol irrigations twice daily, with light eusol dressings substituted for salt pack. Temperature 99°, pulse 90. Little pain.

June 23rd. Wound almost clean, and covered with healthy granulations. Under an anaesthetic the articular cartilages on the head of the tibia were removed and the spine chiselled away. The patella flap was sutured in position, aluminium plates being employed. A thin rubber drain was left in the posterior parts of the joint. The limb was put up straight on a ham splint, suspended in a Thomas splint. The wound healed well, and when evacuated to England on July 9th there was only a small sinus discharging on the internal aspect of the joint.

The foregoing is a summary of a wide subject, and one which we venture to think has not as yet received the attention it merits. We hope that this short article may prove an incentive to others to make known their views.

Owing to the present stress of work we apologize for the somewhat crude method in which the subject has been presented.

THE USE OF ATROPINE AS AN AID TO THE DIAGNOSIS OF TYPHOID AND PARA-TYPHOID A AND B INFECTIONS.

(Preliminary Note.)

BY H. FAIRLEY MARRIS,

CAPTAIN (TEMPORARY) R.A.M.C., BRITISH EXPEDITIONARY FORCE, 1916.

DURING the past year I have studied and recorded graphically the various cardiac irregularities met with in typhoid and paratyphoid fevers. In the course of this investigation, carried out on lines advocated by Sir James Mackenzie, I was led to devote special attention to the relatively slow heart-rate which commonly occurs in this group of fevers. It is well known that atropine increases the rate of the heart by some twenty to forty beats per minute. I found that the rate of a slowly beating heart in each of these fevers was hardly accelerated at all by the injection of $\frac{1}{33}$ grain of atropine sulphate hypodermically.

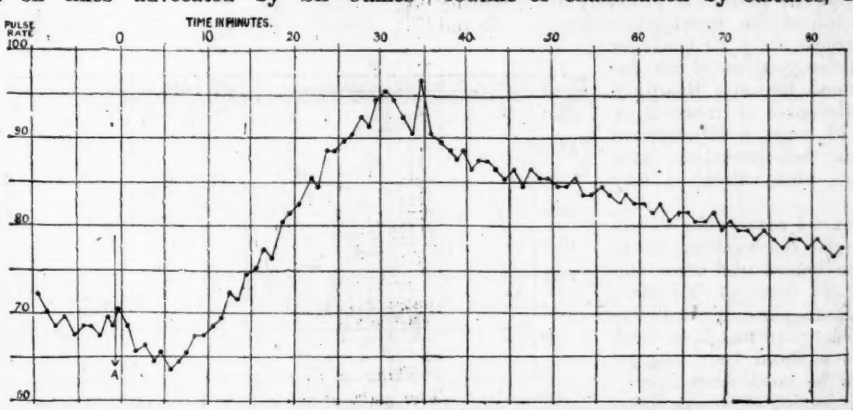


CHART I.—Effect of hypodermic injection of $\frac{1}{33}$ gr. of atropine sulphate (A) upon the pulse-rate of a healthy man aged 24 who was bacteriologically and serologically shown to be free from typhoid, paratyphoid A, or paratyphoid B infections. (Mackenzie polygraph.)

Further observations showed me that in practically all cases of the typhoid group during some period of the infection the rate of the heart could not be increased by atropine as the rate can be accelerated in normal people and those suffering from other diseases. As I found that the failure of the heart to respond to atropine was so constant in all cases bacteriologically proved to belong to the typhoid group I began to use this reaction as a means of diagnosis.

The whole of the work on this subject was carried out at a stationary hospital (under command of Lieutenant-Colonel C. R. Evans, D.S.O., R.A.M.C.) which is specially equipped for typhoid cases and possesses a full bacteriological laboratory, where, in addition to the ordinary routine of examination by cultures, Professor Dreyer's method of diagnosis by agglutination has been employed under his personal advice, and used to control all the cases enumerated in this paper.

Method of Making the Test.

At least one hour after a meal should elapse. The patient should lie horizontally and be instructed to keep perfectly quiet throughout. The pulse-rate is then taken and recorded minute by minute until found to be steady. Usually ten minutes will be found to suffice for this;

then $\frac{1}{33}$ grain atropine sulphate is injected hypodermically, preferably in the triceps region to ensure rapid absorption. The patient now remains absolutely quiet, and, after an

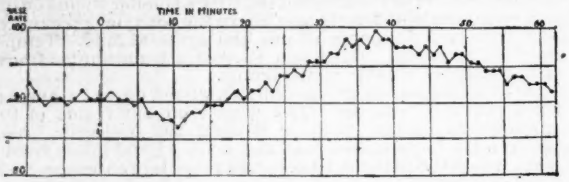


CHART II.—Effect of hypodermic injection of $\frac{1}{33}$ gr. of atropine sulphate (A) upon the pulse-rate in a bacteriologically proved case of paratyphoid B infection (bacillus isolated from stools serologically positive to paratyphoid B infection) on the twelfth day of disease. Temperature 102.5°. (Mackenzie polygraph.)

interval of twenty-five minutes, the pulse-rate is again taken and recorded minute by minute until it is obvious that any rise which may have followed the injection of atropine has passed, and that the rate is falling to a lower level—fifteen to twenty minutes may be necessary. An actual reading would be as follows:

Before atropine:

Pulse-rate ten consecutive minutes—

72 70 68 69 67 68 68 67 69 68.

After atropine:

Twenty-five minutes later—

89 90 92 91 94 95 94 92 90 96 (coughed)
90 89 88 87 88 86 stop.

The mean value of the pulse-rate in the first series of observations is judged to be 68. In the second series the pulse-rate is rising and falling on a curve similar to that shown in Chart I. The aim is to choose that rate which lies along the top of the curve. Excluding incidental changes due to muscular movements, coughing, and so on, the mean highest value in this series would be judged to be 94. The difference between the pulse-rate before and after atropine is in this case 26 beats a minute.

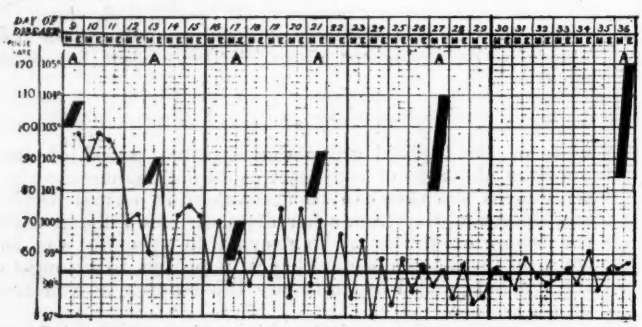


CHART III.—Case of true typhoid. Fully inoculated, six months previously, against typhoid only. *B. typhosus* isolated from stools, positive to agglutinations. A = Atropine $\frac{1}{33}$ gr.

As an arbitrary rule, an increase of the pulse-rate by about 20 or more beats a minute after atropine may be accepted as an indication that the patient is probably not suffering from typhoid or one of the paratyphoid series. Should the pulse-rate increase only 10 beats or less the reaction is suggestive of an infection by one of these diseases. Readings which give a difference of more than 10 and less than 20 beats a minute are uncertain in their interpretation, and necessitate further observations a day or so later.

The curve in Chart I represents a continuous series of pulse observations made on a healthy man before and after the injection of the test dose of atropine. The actual figures are those given in the preceding table. The man had been fully inoculated against typhoid four months previously. It will be noted that immediately after the injection of the atropine there was a fall in pulse-rate for a few minutes, then a rapid and marked acceleration, which gradually fell away some thirty minutes after the injection of the drug, and reached the base line about one hour and twenty minutes later.

In Chart II we see the effect of $\frac{1}{33}$ grain of atropine in a bacteriologically proved case of true paratyphoid B. The patient had been fully inoculated against typhoid only in October, 1914, some eighteen months previously. After the injection of the atropine there is to be noted a gradual fall in pulse-rate and subsequent gradual slight increase in rate, reaching a maximum after thirty-five minutes, and regaining a base line an hour or so later. In some cases the slowing is so marked that the pulse-rate does not regain the initial rate after one and a half hour's observation, so that the atropine has actually caused persistent slowing of the heart.

A study of these two curves will show that from a practical point of view the period of twenty-five minutes immediately following the injection may be neglected, as the "highest mean rate" is generally attained near the end of the first half-hour.

In the accompanying charts are shown the effects of atropine upon the rate of the pulse on various days

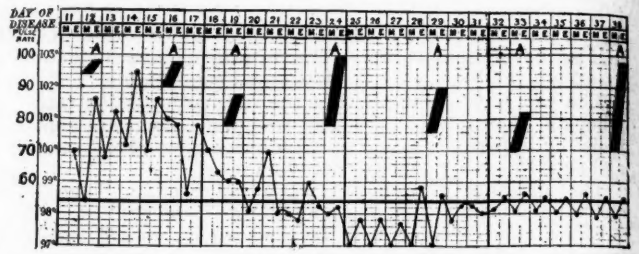


CHART IV.—Case of paratyphoid B. Fully inoculated, five months previously, against typhoid and paratyphoid A and B. Bacillus isolated from stools; agglutinations positive to *B. paratyphosus* B. A = Atropine $\frac{1}{33}$ gr.

throughout the disease, in bacteriologically proved cases of true typhoid (Chart III), paratyphoid B (Chart IV), and paratyphoid A (Chart V), occurring in inoculated men; and of true typhoid in an uninoculated man (Chart VI).

Explanation of Charts.

In the charts the numerals to the left of temperature figures denote the pulse-rate, ten corresponding to the interval between each degree of temperature. The thick dark bands denote the effect of the injection of atropine upon the pulse-rate, on days shown, the lower end corresponding with the average rate before the atropine, the upper end to the mean highest rate reached after the atropine. The length of these dark bands consequently indicates the extent of "escape" on acceleration.

Case of True Typhoid in an Inoculated Man.

In this case (Chart III) on the ninth day of the disease, after the injection of $\frac{1}{33}$ grain atropine the pulse-rate rose from 100 to 108—that is, "escaped" 8 beats.

		"Escape."
On the 13th day	82–90 ...	8 beats.
,, 17th day	58–70 ...	12 ,,
,, 21st day	78–92 ...	14 ,,
,, 27th day	80–110 ...	30 ,,
,, 36th day	84–120 ...	36 ,,

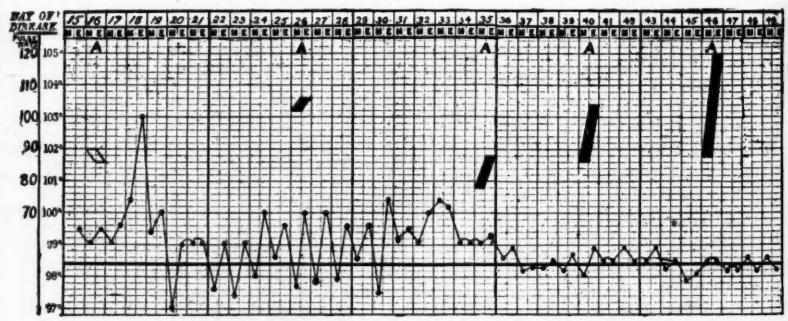


CHART V.—Case of paratyphoid A. Fully inoculated, eight months previously, against typhoid only. Bacillus recovered from blood, and positive to agglutinations. A = Atropine $\frac{1}{30}$ gr.

Case of Paratyphoid B in an Inoculated Man.

The patient was a man aged 21, who had been inoculated five months previously against typhoid and para-

typhoid A and B. The case was proved bacteriologically, the bacillus being recovered from the stools. (See Chart IV.) On the twelfth day, after the injection of atropine $\frac{1}{50}$ gr., the pulse-rate rose from 94 to 98.

		"Escape."
On the 16th day	90–98	8 beats
,, 19th day	78–88	10 ,,
,, 24th day	78–100	22 ,,
,, 29th day	76–90	14 ,,
,, 33rd day	70–82	12 ,,
,, 38th day	70–98	28 ,,

Case of Paratyphoid A in an Inoculated Man.

The patient, a man aged 30, had been inoculated eight months previously against typhoid only. (Chart V.) On the day of the first injection of atropine (the sixteenth day of the disease) the pulse failed to regain its initial rate, and so lost five beats a minute. This extreme reaction is apparently more common in the paratyphoids than in the true typhoid. On the twenty-sixth day, after the injection of atropine $\frac{1}{50}$ gr., the pulse-rate rose from 102 to 106.

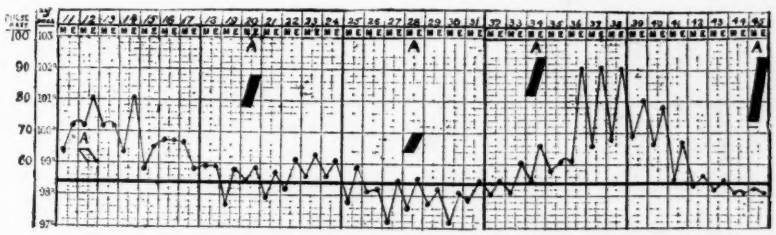


CHART VI.—Case of typhoid; not inoculated. *B. typhosus* in urine, positive to agglutination. A = Atropine $\frac{1}{50}$ gr.

		"Escape."
On the 35th day	78–88	10 beats
,, 40th day	86–104	18 ,,
,, 46th day	88–120	32 ,,
,, 53rd day	80–118	38 ,,

It will be noted in each of the diseases shown that during some period of the illness the pulse-rate fails to quicken under the influence of atropine in the normal manner.

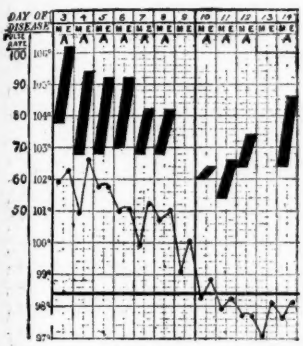


CHART VII. Case showing fleeting reaction in a very mild case of paratyphoid B infection. A = Atropine $\frac{1}{50}$ gr.

Time of Appearance of the Reaction.

As the cases do not as a rule come under observation before the tenth day of disease, the opportunities for studying this point have been few. From experience of the reaction in some 400 cases (bacteriologically controlled) the reaction is most constantly observed during the second week of the disease, and one or more observations during this period have shown its presence in the vast majority of cases. I have seen it well marked on the fifth day, often on the seventh day, most constantly about the tenth day. It has disappeared by the fourteenth day, but has persisted as late as the hundredth day, waxing and waning with relapses, although apparently not confined to the febrile period.

Safeguards against Erroneous Deductions.

Age.—It must be remembered that, with advancing years, the heart normally responds less and less to the action of atropine, so that in individuals over 50 a diagnosis of a typhoid group should be made with reserve if the acceleration is more than 10 beats a minute. My experience has been confined to males between 17 and 47 years of age.

Previous Cardiac Disease.—From my early experience of the action of atropine on sclerotic conditions of the heart, I learnt that victims of cardio-sclerosis failed to respond by quickening in the usual manner. Fallacies from this cause must be excluded in applying the test.

Rapid and Irregular Action of the Heart.—Observations upon such cases are liable to lead one astray for obvious reasons. (See Chart VIII.) Atropine itself may cause extra-systoles (very occasionally), and in these cases the observations are untrustworthy.

The Effect of Inoculation upon the Atropine Curve.

After some difficulty in finding such an individual I was able to record the effect of equal doses of atropine upon an uninoculated man and then on certain days to repeat the experiment after an inoculation with typhoid vaccine. Chart IX shows the reaction as observed throughout. Two observations previous to first inoculation showed an escape of about twenty-two beats, then on the fifth day after ½ c.cm. typhoid and paratyphoid A and B vaccine, the reaction began, the rate being raised from 60 to 70 beats only; on the seventh day the rate fell from 76 to 72 beats; on the ninth day the rate was again raised from 74 to 80 beats. The second dose of T.A.B. vaccine was administered on the eleventh day.

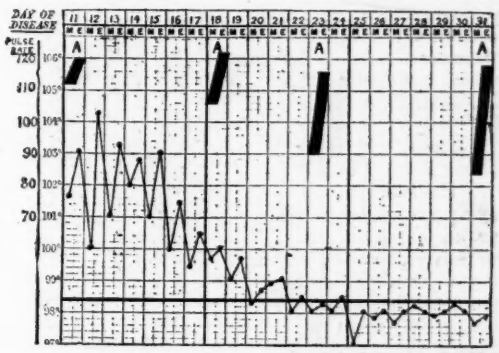


CHART VIII. In this chart is seen the reaction to atropine obtained on several days of a "suspect" bacteriologically negative to typhoid group and subsequently regarded as a case of broncho-pneumonia. I do not regard this as an example of a positive atropine reaction, as the extreme height of acceleration under the atropine is approximately the same on each occasion. A = Atropine $\frac{1}{50}$ gr.

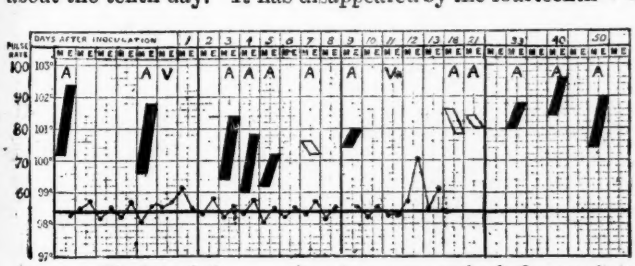


CHART IX.—Inoculation experiment on a man who had never been inoculated, and whose blood did not agglutinate either typhoid or paratyphoid A or B. On the twenty-first day after an inoculation of ½ c.cm. of T A.B. vaccine, and the ninth after an inoculation of 1 c.cm. of the same vaccine, the blood agglutinated all three organisms. A = Atropine $\frac{1}{50}$ gr. V = T.A.B. vaccine ½ c.cm. V = T.A.B. vaccine 1 c.cm.

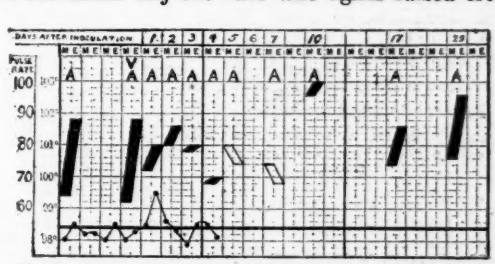


CHART X.—Effect of a single dose of vaccine on the atropine curve in a young man. (Note how soon after inoculation the effect is evident.) Previous to inoculation the blood did not agglutinate either typhoid or paratyphoid A or B. After inoculation the blood agglutinated all three organisms. A = Atropine $\frac{1}{50}$ gr. V = T.A.B. vaccine ½ c.cm.

By the eighteenth day the pulse fell from 86 to 78.
On the twenty-first day the pulse fell from 84 to 80.
On the thirty-third day the pulse rose from 80 to 88.
On the fortieth day the pulse rose from 84 to 96.
On the fiftieth day the pulse rose from 74 to 90.

Agglutination tests previous to inoculation showed the individual to be free from infection of the typhoid group, recent or old, and also that he had not been inoculated, whereas after inoculation he was shown to possess agglutinins against typhoid and paratyphoid infections.

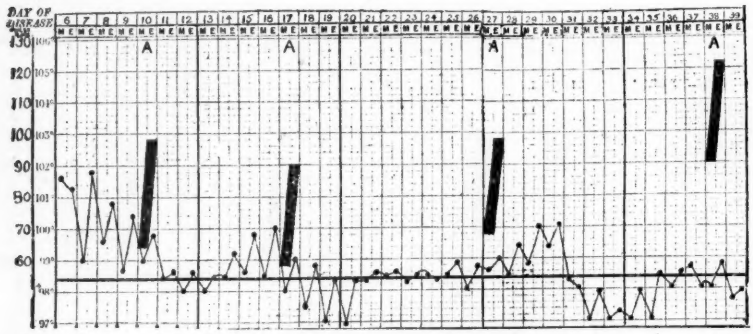


CHART XI.—Case of bronchitis. Bacteriologically free from typhoid and paratyphoid A and B infections. A = Atropine $\frac{1}{150}$ gr.

Chart X shows the great rapidity with which the reaction to the atropine test may develop after a single dose of vaccine given to a young man. From a total of six observations similar to the above it appeared that inoculation would affect the atropine reaction for probably ten weeks, and I conclude that the atropine reaction should be repeated after a few days if a "suspect" has been inoculated within that time. In these cases a definite conclusion can be drawn only when the change under atropine is well marked in one direction or the other after a second observation. Further observations are needed to determine precisely the limits of such a reaction.

The Action of Atropine on other Febrile Conditions.

The opportunity of making prolonged observation on many other febrile conditions was unfortunately not available to me, so that it is only upon such suspects as appear below that I have had any experience, because the cases which were shown bacteriologically to belong to other diseases than the typhoid group were soon removed from the hospital in which I was working.

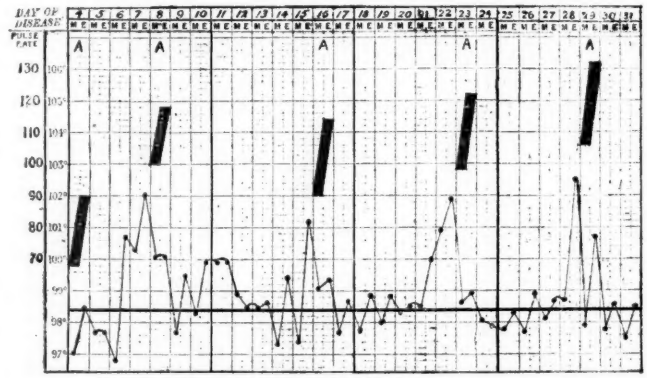


CHART XII.—Case of trench fever. Bacteriologically free from typhoid and paratyphoid infections. A = Atropine $\frac{1}{33}$ gr.

Charts XI, XII, and XIII, are from cases clinically diagnosed as bronchitis, trench fever, and pyrexia of unknown origin, and bacteriologically free from typhoid or paratyphoid A or B infections. In each case it will be noticed that at every observation the heart is seen to respond to the atropine in the normal manner.

Among the "suspects" the following diseases were diagnosed and failed to show the reaction:

Bacteriologically proven:
- Dysentery, bacillary and amoebic.
- Cerebro-spinal fever.
- Pulmonary tuberculosis.
- Tuberculous meningitis.
- Miliary tuberculosis.
- Septic meningitis.
- Malaria.
- Relapsing fever.
- Typhoid and paratyphoid fever carriers.
- Jaundice, excepting when associated with typhoid and paratyphoid infection.
- Gaertner.
- Septicaemia.

Clinically:
- Trench fever.
- Bronchopneumonia.
- Pneumonia.
- Pleurisy.
- Rheumatism.
- Influenza.
- Rheumatoid arthritis.
- Appendicitis.
- Pyrexias of obscure origin.
- Meningismus of unknown origin.

A notable feature of the cases which proved to be of meningeal origin was the excessive acceleration after atropine—from 40 to 60 beats—a point which may assist in the diagnosis of suspects of that class of diseases.

Total Analysis.

The observations on the following 200 cases of "suspects" were carried out according to a uniform routine by the sisters in charge, and were made within a day or two of admission to hospital, and no case beyond the twenty-first day of his disease is included.

In addition to this series I have records of about 100 cases which were examined by myself before the single routine was established. These are not included, because I wished to control my own series.

Analysis of 200 Cases, with Bacteriological Diagnoses.

36 cases: Typhoid, paratyphoid A and B bacillus isolated and positive to agglutination. The reaction was shown in 34, poorly marked in one, and entirely absent in the other—a fatal case, in which the pulse-rate was never relatively slow, the true cause of death being discovered at autopsy.

58 cases: Mixed. Positive to agglutination only. The reaction was shown in 45, absent in 13.

101 cases: Declared to be negative to typhoid or paratyphoid A or B infections. The reaction was present in 8.*

5 cases: Declared to be "carriers" bacteriologically proven. The reaction was always absent.†

I have experimented with various doses on normal individuals, and found that with $\frac{1}{33}$ grain or more the acceleration of the pulse was practically constant.

A very noticeable feature of the test is that individuals suffering from a typhoid group infection show a remarkable tolerance to atropine, and the other effects—for example, thirst, pupillary changes, etc.—are apparently in abeyance. A glance at Chart XIII would seem to show that the test may be applied indefinitely.

Further investigation may reveal the fact that other diseases may produce this phenomenon, but so far this reaction has been a very constant clinical sign in typhoid and paratyphoid fevers and has so frequently been supported at a later date by the bacteriologist.

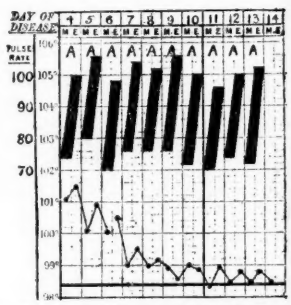


CHART XIII. A typhoid "suspect" examined daily and proved to be bacteriologically negative to typhoid group. A = Atropine $\frac{1}{33}$ gr.

Before closing I wish to express my thanks to Professor Dreyer, Lieutenant-Colonel Gratton, Captain Wood, R.A.M.C., Captain Perry, R.A.M.C., Captain Young, R.A.M.C., Captain Bazett, R.A.M.C., Captain Tytler, C.A.M.C., and Captain Shanks, C.A.M.C., for the bacteriological controls, and to Sisters Annandale and Best, who toiled ungrudgingly at such a tedious task.

NOTE.—An account in detail with further observations on 400 cases is about to be presented for publication.

* Some of these cases showed such a remarkable resemblance clinically to these diseases that the possibility of an undiscovered member of the group occurs.

† From these and other cases I conclude that the reaction is indicative of active disease only.

IT is reported that the French Government has reason to expect that stretcher-bearers may shortly be returned from Germany, where they have hitherto wrongfully been detained prisoners.

THE WHIRLPOOL BATH.

BY

F. P. NUNNELEY, D.M., M.A.Oxon.,

Honorary Medical Officer, Llandrindod Wells Hospital; Commandant and Medical Officer in Charge, Red Cross Auxiliary Hospitals for Officers, Brighton; late Honorary Captain, R.A.M.C., B.E.F.

"Eau courante" had been, for some time before its introduction into this country, extensively employed in France for the treatment of stiff joints, contractures and other conditions resulting from injuries sustained by soldiers during the present war. The treatment, as carried out at the Grand Palais, was investigated by Dr. Fortescue Fox on behalf of a committee of the Balneological Section of the Royal Society of Medicine. His recommendation that the whirlpool bath should be introduced into military hospitals was adopted by the committee and brought to the notice of the military authorities.

The first baths made in this country were copied from the French model, in which the hot and cold water supplies are led into a mixing chamber whence the water, at the required temperature, passes into the bath through a number of jets. After rushing round the bath, the water flows out through an opening near the top. The whirlpool is thus produced by a constant stream of rapidly flowing water. To obtain a satisfactory whirlpool, a pressure of at least 50 ft. is required and the consumption of water is very considerable. To obviate these disadvantages, a bath has recently been devised in which the whirlpool is produced by an electrically driven turbine, placed under a grating at the bottom of the bath. A small quantity of hot water is admitted from time to time, in order to maintain the temperature, whilst a corresponding amount is allowed to flow out through the waste pipe. A very small quantity of water is thus required and, if necessary, the bath may be filled from cans. An apparatus is fitted by means of which compressed air can be forced through the water, which is thus caused to bubble violently, an addition which should prove of particular value in neuritis.*

All the leg baths at present in use are cylinders in which immersion above the middle of the thigh is impossible. At my suggestion, Messrs. Shanks and Co. (81, New Bond Street) are making a motor bath fitted with a seat which can be moved up or down and adjusted to any angle to accommodate any form of stiff hip. If the knee only requires treatment, the seat is fixed above the level of the water, and the uninjured leg can be kept dry. If the hip-joint is to be treated, the seat is lowered and fixed at the appropriate angle, but both limbs are necessarily immersed.

The following notes are based upon experience gained in the Physical Treatment Department of the Red Cross Auxiliary Hospitals for Officers, Brighton. The baths are of the French type and were presented by H.R.H. the Princess Royal. They have been in use for over four months, during which time more than sixty cases have been treated.

The period of immersion is usually twenty minutes; the temperature should be as high as can be comfortably borne—in most cases from 110° F. to 120° F. Before the limb is immersed the bath is filled with water at about 100° F. and the temperature is gradually raised to the limit of endurance. It will frequently be found that the higher ranges of temperature, 110° F. to 120° F., cannot be borne at first, but, as a rule, after one or two treatments, tolerance is acquired. It is necessary to proceed very cautiously when treating cases in which nerves have been injured and there are areas of anaesthesia or partial anaesthesia. The skin supplied by the injured nerves is frequently in a very atrophic condition, and scalding of these areas may take place without the patient having complained of any discomfort in the normal portions of the limb. Very shortly after the limb has been immersed in the bath the skin becomes flushed, pain is relieved and a feeling of comfort is experienced. The tissues become more supple and movements can be made which previously were painful or impossible. After the bath the limb is found to be in a condition of considerable hyperaemia. The skin is red and feels hot, and it is probable that the internal temperature of the limb also is temporarily raised. There is usually a slight increase in bulk, varying in the case of the thigh from one-half to one-third of an inch in circumference. The tissues are soft and relaxed, and will bear manipulations which before the bath would have been too painful.

In a large majority of cases the whirlpool bath is used as a preparation for subsequent massage and manipulation. In the Red Cross Auxiliary Hospitals for Officers at Brighton, radiant heat was formerly used for this purpose. When the whirlpool baths had been installed they were substituted for the radiant heat in every possible case, so that the views of masseurs and patients who had had experience of both methods of treatment could be obtained. The opinions expressed were unanimously in favour of the baths. The masseurs said that the tissues and joints were more easily manipulated, and the patients that the manipulations were less painful. Subsequent experience has confirmed the correctness of these early observations. Adhesions are frequently and almost painlessly broken down, and function seems to be restored more rapidly. Some members of my staff have found that, when there is great tenderness, they can employ deeper massage and obtain more movement while the limb is still in the bath than if they wait till afterwards. But the whirlpool is not only a thermal bath; in virtue of the lavage and elastic pressure produced by the rapidly moving water, it must be regarded as an efficient form of gentle massage. In cases in which the use of hand massage is contraindicated by the danger of disturbing the barriers erected by nature against the spread of infection, the whirlpool bath is of considerable value. An increased flow of blood is induced by its thermal qualities, whilst resolution and removal of inflammatory products is facilitated by the massage of the rapidly moving water.

When nerves in the vicinity of a wound have been slightly injured but not destroyed, treatment is apt to be extremely difficult. The application of heat frequently increases the pain, whilst massage, which may be urgently needed for the preservation of the utility of the limb, is rendered impossible by the pain it causes. In these cases, the whirlpool bath at a "neutral" temperature acts not only as a substitute for hand massage, but also relieves the pain to a remarkable extent.

The pain in the missing hand or foot, so frequently felt after amputation, is rapidly allayed by the whirlpool bath. The effect of the bath seems to be increased if one of the jets is allowed to play directly on the tissues covering the nerve which is apparently at fault.

The use of the whirlpool bath as a preliminary to the breaking down of adhesions under anaesthesia is of doubtful value. Owing to the hyperaemic condition of the tissues, the advantage gained by the decreased amount of force required seems to be more than counterbalanced by the increased bruising which ensues.

So far as my information goes, the whirlpool has not yet been employed in the treatment of recent wounds, but it seems probable that its use in this connexion would be valuable, especially when a large sloughing area could be exposed to the action of the water. Owing to the difficulty of cleansing the turbine bath, it would be necessary to use an apparatus of the French type.

The following cases may be of interest as illustrating the foregoing remarks. Except when otherwise noted, the angles are calculated from the position of full extension, the axis of the upper bone entering into the joint and an imaginary line produced past the joint, in continuation of the axis, forming the diameter of a circle of which the joint is the centre—for example, 10 degrees of flexion at the knee-joint means that the tibia, forming a radius of the imaginary half circle, makes an angle of 10 degrees with the imaginary line passing through the knee-joint.

1 and 2. *Fractures of Femur.*—Fracture of left femur (December 2nd, 1915) 2 in. below great trochanter. Admitted July 4th, 1916; much periarticular swelling of knee-joint, a little fluid in joint, flexion 10 degrees. Whirlpool bath and massage. August 26th: Very little periarticular swelling, still a little fluid in the joint, flexion 90 degrees. G. S. W. Fracture right femur, upper third. Admitted July 29th, 1916. Wound healed, flexion of knee 20 degrees. Whirlpool bath and massage. September 1st: Flexion 113 degrees.

3. *Shell Wound.*—Left foot; very septic. Admitted July 14th, 1916. Wounds healed, much swelling of foot and ankle, foot in toe-pointed position. Range of movement at ankle 15 degrees.

* Motor baths, with the compressed air attachment, have been installed at the Physical Clinique for Wounded and Disabled Soldiers, 126, Great Portland Street, W.

No movement at interphalangeal or metatarso-phalangeal joints. Whirlpool bath and massage. September 1st: Swelling much decreased, all interphalangeal and metarso-phalangeal joints move well. Range of movement at ankle 23 degrees.

4. *Fracture of Humerus.*—G. S. W. Comminuted fracture lower end of left humerus. Admitted August 9th, 1916. Wound healed, union firm, pronation and supination weak and incomplete, elbow can neither be fully extended nor fully flexed. Range of movement 30 degrees. Whirlpool, massage. September 1st: Pronation and supination complete and fairly strong. Range of movement at elbow-joint 70 degrees.

5. *Septic arthritis* of the knee; incisions. Admitted July 7th, 1916. Much periarticular thickening, fluid in joint, flexion 60 degrees. August 8th: No fluid in joint, very little periarticular thickening, flexion 120 degrees.

6. *Traumatic arthritis*, right knee. Admitted March 28th, 1916. Much periarticular swelling. *X* ray: "Lining" of cartilage; no bony change. Can bear no weight on knee; walks with crutches; no movement at knee-joint. Radiant heat and massage. May 25th: Very little improvement; still on crutches. Whirlpool bath and massage. July 15th: No swelling of knee; walks well with stick. Flexion at knee-joint 90 degrees.

7. *Amputation*, right arm. Admitted May 20th, 1916. Tenderness of stump; much pain in missing hand. Whirlpool bath. June 14th: No tenderness of stump; no pain in missing hand.

8. *Wound of axilla*, bruising of brachial nerves. Admitted June 13th, 1916. Much neuritic pain, referred chiefly to fingers. Partial anaesthesia, dorsum of thumb and index finger and radial side of hand and wrist. No power of extension of fingers. Elbow flexed at right angle; no power of extension beyond this point. Paralysis of supinator longus and extensors of wrists. Radiant heat followed by massage, or either alone, caused increased pain. July 3rd: Whirlpool bath at temperature of 99° F. Immediate alleviation of pain; tolerance to gentle hand massage after six treatments. August 8th: Very little pain; sensation returning; some power of flexion of fingers; supinator longus recovering; extension of wrist weak but complete. Extension of elbow to 50 degrees.

RELIEF STAINING FOR BACTERIA AND SPIROCHAETES.

By T. H. C. BENIANS, F.R.C.S.,

PATHOLOGIST TO THE PRINCE OF WALES'S GENERAL HOSPITAL, TOTTENHAM.

(From the Laboratory of the Addington Park War Hospital.)

By the ordinary methods we seek to colour bacteria in films to make them the more evident on a colourless background. The excess of light that meets the eye dulls our perception of the germs, and probably often causes us to lose sight of the most minute. Instead of staining the micro-organisms, we may leave them colourless and brilliant in a coloured and less transparent background. This is done, for example, in the Indian-ink method and in Harrison's collargol method of demonstrating spirochaetes. I have devised a rapid and simple process to obtain a uniform blue field from which the unstained organisms stand out in sharp relief. The depth of colour may be varied from a pale grey to a deep blue-black, being rather deeper immediately around the edge of the organism. The whole process occupies only a few moments.

A small drop of a 2 per cent. aqueous solution of Congo red is placed on a slide, and a very small quantity of the bacterial culture, or of the exudate to be examined, is rubbed into it with the platinum wire; the drop is then spread out into a tolerably thick film either with the wire or by means of another glass slide. The film, an opaque blood red, is allowed to dry; the slide is then washed over with a 1 per cent. solution of HCl in absolute alcohol and dried in the air, or with blotting paper, although the latter is apt to tear the film. The film is then ready for examination with the oil immersion lens. It is possible to apply the process to a film which has been already spread and fixed on the slide, by spreading the Congo red gently over it, drying, and treating with acid, as described above.

Under the $\frac{1}{12}$ in. lens the background may show an extremely fine stippling, but as a rule it will be quite uniform. Either natural or artificial light may be used, but it needs to be fairly strong, especially if a thick part of the film has to be examined.

Broth and salt solutions do not form a satisfactory mixture with the Congo red, and emulsions in these fluids ought first to be thrown down in the centrifuge. Serous exudates mix readily and evenly with the dye. Blood is not so satisfactory, but, except for osmotic changes in the red cells, useful preparations of the blood fluid, and its cellular contents may be made; the films should be spread quite thinly. Urinary deposits and faecal material may both be examined by this method; in one faecal specimen I examined, large numbers of spirochaetes of various types were present. This same material examined with the dark background condenser gave a much less satisfactory picture on account of the relatively large amount of amorphous substance, and motile bacteria crowding the field. Spirochaetes as a rule show up fairly sharply, though they have not the brilliancy that the dark background condenser gives them, and of course one has not here the opportunity of observing them in motion. Bacteria vary somewhat in their relation to the dye; mostly they are clear, sharp, and quite transparent, but a certain number of them will take up the dye and appear as ill defined, bluish-black bodies: this I have noticed chiefly in old cultures of Gram-negative organisms. Some cocci show a dark central spot, and in the case of many of the *coli*-typhoid type of bacilli a similar round dark spot is seen toward each pole, or more often a dark rod-shaped area running down the centre of the bacillus. Somewhat similar appearances may be seen with Indian-ink preparations; it is impossible to say whether these represent nuclear bodies or some irregularities of external contour which have caught and held the dye. Many bacilli show a dark central portion with colourless poles, giving the appearance that the poles, either by being club-shaped, or by being bent up, had risen above the surface of the film whilst the centre part remained buried in it.

The apparent size of an organism viewed through an opaque film naturally depends on the thickness of the film—that is to say, on whether the film is sufficiently thick to more than cover the greatest diameter of the organism. Seen through an opaque film an organism usually seems much larger than it appears in a stained preparation. It was pointed out to me by Dr. Hort that in cases of septicaemia the presence of bacteria can be easily demonstrated, even when they are only present in relatively small numbers, by taking a quantity of the infected blood in distilled water and then throwing down in the centrifuge. When the deposit is examined in a Congo red film the amorphous substances blend with the background and the bacteria are easily seen. The process is far simpler than the examination of a stained film would be in such a case. He has also used Congo-red films for the demonstration in filtrates of very minute micro-organisms near the limits of vision, films stained by ordinary methods entirely failing to reveal their presence. In work of this nature it is, of course, necessary to be certain that the distilled water used in making up the reagent is quite bacterium-free, and a control film should be prepared to show the absence of bacteria.

In conclusion, it may be claimed for this method that it has certain definite advantages over other relief staining methods, in that it can be freshly made up with bacterium-free water; and that it gives a clean and even background, which has very little tendency to form cracks and fissures. I have not been able to test its value in photomicrography, but where a clear sharp outline of the organism is required I should judge it could be used with the best of results.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

CONCURRENT MEASLES AND CHICKEN-POX.

I AM not aware of any instances of cases of this character. Certainly I have not met any such during a professional life of over forty years. My patients were two boys and two girls.

Jim commenced with an attack of measles February 1st.

John developed chicken-pox February 6th and measles February 10th, both rash and spots being well out together.

Peggy began with measles February 18th and developed chicken-pox March 3rd.

Ermin developed chicken pox and measles February 25th, practically simultaneously.

John, Peggy, and Ermin were very distinctly ill.

John had been exposed at school to chicken-pox and Jim to measles.

London, W. A. J. RICE-OXLEY, M.D., M.R.C.P.

GYMNASTIC EXERCISES FOR HYDRARTHROSIS OF THE KNEE-JOINT.

In 1912 I was consulted by a clerk to a British merchant at Puerto Orotava who had been suffering for some two or three years from increasing chronic hydrarthrosis of the right knee, which he traced to a long walk up to the mountains. The muscles were much wasted, and he was so disabled that he had to go to and from his office in a wheel chair. One day I was suddenly called and found him lying unconscious on the ground, owing to acute pain produced on rising from his seat at the office. I advised him to go to London, where Mr. Barker admitted him into University College Hospital, and on October 5th, 1912, cut open the knee-joint, and pared off a great deal of exuberant synovial membrane; he found no loose cartilage or loose body that could have accounted for the pain above referred to. After the operation the patient was able to do his work much better than before. About July, 1915, his other knee began to be similarly affected, and on distinct effusion into the joint being detected, the case was treated in the old way, by rest, counter-irritation, etc. Early in 1916 the patient came to me in great distress. I had just read an article by Dr. H. Gautiez in the *Journ. de méd. et de chir. prat.* of October 25th, 1915, where it is contended that in many such cases the real cause of the trouble is weakness of the muscles and tendons at the back of the knee-joint, and that they may be strengthened by flexion carried out by the attachment of gradually increased weights to the foot, etc. I gave the article to the patient, who carried out all the instructions. In a very short time, as the flexor muscles and tendons were strengthened all the effusion disappeared. Since then the patient, who is a very intelligent man, has gone on well. He began by raising a small weight (shot in a bag), increasing the amount to 3 lb. or 4 lb.; the number of daily flexions thus made at intervals throughout the day is about 300.

Such cases will not be uncommon among invalided soldiers, and, as the treatment is so simple and can be carried out by the men themselves, I have thought it worth while to direct attention to the fact that the flexor muscles and their tendons can be strengthened by gymnastic exercises patiently carried out.

Santa Ursula, Teneriffe. GEORGE V. PEREZ.

Reports of Societies.

EPIDEMIC NEPHRITIS.

At a meeting of the Medical Society of London on November 13th, Lieutenant-Colonel D'ARCY POWER, President, being in the chair, a discussion on epidemic nephritis took place.

Etiology and Symptoms.

Captain LANGDON BROWN said that acute nephritis was rare in men of military age. It was not common apart from the American Civil War, in which 14,000 examples of nephritis occurred, but this number included cases both of acute and chronic nephritis. In the central army the number of cases rapidly increased, the incidence rising for twelve months, and reaching as high as 1.5 per 1,000. This was not repeated in subsequent years. In that war the military conditions were somewhat similar to those of the present war—a rapid advance and retreat being followed by a period of trench warfare. The units were involved in the same irregular and patchy manner. In our own army down to the end of June, 1915, there were 1,062 cases. Few occurred before February of that year. They increased until 1916, when there was a steady fall. The Belgian army had been unaffected, and the French little until July, 1915. Few cases occurred in the Mediterranean zone. A similar outbreak had appeared among the German and Austrian troops.

The cases on which the paper was based fell into two groups—one of 58 studied at St. Bartholomew's Hospital, the other of 108 at the 1st London General Hospital. Nine were from the Mediterranean, the remainder from France. Few officers were included, numbering only five of the whole series and two others in addition. The cases were haphazard in their distribution. Only one case had been in France for less than one month. The numbers increased for each month's stay in France, but fell again after the seven months period was reached. Exposure could not be held to be of etiological importance, for there were few cases during the worst weather, and the number increased after the spring, when the violent fluctuations of temperature were past. In the South African war there were practically no cases of nephritis although the range of temperature was enormous. The same was true of the Suvla Bay operations and of the Russo-Japanese war. In 22 only of 166 cases in which this point had been elucidated was there a history of the patient having been wet; in the remainder there was no history of exposure. Cold, however, accentuated chronic nephritis. There was no evidence that the affection was dependent upon the water supply as had been suggested. The solder and lead which might contaminate tinned foods had been blamed by some, but this was not a likely explanation, or the condition would have been present in South Africa and Suvla Bay where tinned foods were much employed. The urinary conditions in nephritis of metallic origin were, moreover, of a different character. By others, excess of protein and a deficiency of fresh vegetables in the diet was held responsible, but this would not explain the increase in the French army in July, 1915, nor was there any evidence of a coexistent intestinal toxaemia. Wounded soldiers were not especially liable to nephritis.

It had been suggested that the nephritis was a complication of an epidemic of a suppressed form of scarlet fever, and the comparative freedom of the Indian troops, who are immune to that infection, was cited in evidence, as well as the occurrence of sore throat at the beginning of the attack. A history of early sore throat was obtained in 27 per cent. of his cases, but he regarded it as secondary to the cough. There were many points of similarity between scarlatinal nephritis and this form, but such a view would mean that there were 10,000 cases of scarlet fever, all suppressed and all free from desquamation, which seemed impossible. A previous history of nephritis was obtained in 13 only, so it could hardly be due to recrudescence of former nephritis. Nor was antityphoid inoculation the cause, for nephritis had not occurred in a similar manner among the troops at home or in South Africa.

That the condition is due to a specific infection was suggested by the fever at the onset and the relapses, the spread to the French troops four months after its occurrence among the English, and to the Mediterranean area when troops were transferred there from France. Its patchy distribution resembled that of cerebro-spinal fever. The results of *post-mortem* examinations pointed to an involvement of the glomeruli and tubules as in an infective nephritis. Examination of the urine, however, had afforded little support to this view, for of 21 cases examined bacteriologically the urine was sterile in 18. Various organisms had been isolated from the throats of affected patients, but no more frequently or in greater numbers than among controls, and antibodies to these organisms were not found in excess in the blood. Dr. Mackenzie Wallis had been able to reproduce albuminuria in rabbits by inoculating them with the urine of affected persons after an incubation period of eight days, which corresponded approximately with the incubation period as estimated clinically. His investigation suggested that the infective agent was ultra-microscopic and filter-passing. A positive Wassermann reaction was obtained in 18 out of 26 cases examined; this might mean a corresponding incidence of syphilis, or, on the other hand, be due to an animal infection such as that by a filter-passing organism was supposed to be.

Considering next the symptoms of the disease, he said that the incubation period was between six and fifteen days. Premonitory symptoms were met with in about half, according to Captain Abercrombie, and were bronchitic, or febrile or abdominal (pain and vomiting). Oedema was usually the first symptom noticed and was present in 97 per cent. of the cases, but generally lasted only a few days and was not often considerable. Early dyspnoea was noticed in 76 per cent., starting usually at the same time as the oedema but ceasing sooner. It would appear from estimations of the alveolar air that the dyspnoea was not always due to acidosis, uraemic or otherwise, and was possibly explained by a similar effusion into the lungs. He had not observed the wide fluctuations of the blood

pressure described by Abercrombie. The commonest systolic pressure was 140; there were few patients with a really high pressure, and these were men who had been painters or plumbers in civil life. The difference between the systolic and diastolic pressures was very considerable, being about 10 degrees. The findings would account for the fact that cardiac hypertrophy and arterial changes were little evident. The urine was often much increased in amount, even in the acute cases. Red blood cells were seen in it in 102 cases and white corpuscles in 79. A flocculent reddish-brown precipitate, containing blood elements, was commonly met with. Casts were found in the majority. There were blood casts in 2, epithelial in 37, fatty in 7, granular in 73, hyaline in 58. Retinal change occurred in 18 per cent. and convulsions in 4 per cent., but these generally yielded quickly to venesection. Occasional symptoms were herpes and parotitis, suggesting an infective origin. Milkiness of the blood serum was not found in any of the specimens withdrawn for the Wassermann reaction except in one fatal case. Two cases only were fatal; in the majority the patient felt well when the oedema had subsided. The albuminuria was intermittent, and often relapsed and ceased after a period of from fourteen weeks to five or six months. Recovery might be complete after a long period of albuminuria. He considered that all soldiers who had suffered from nephritis should be regarded as unfit for foreign service, and if the albuminuria persisted for more than four months should be discharged. The diastase output must have returned to normal before a cure could be said to have been established.

As treatment he recommended a low nitrogenous diet during the acute stages, but one providing considerable variety. The diet suggested contained 43 grams of protein, 285 grams of carbohydrate, and 50 grams of fat, with a total calorie value of 1,815. When the acute stage was over this might be replaced by an ordinary nitrogenous diet, including mutton or fish, and might contain as much as 95 grams of protein, the total calorie value being 2,690. His experience with theocine had been unsatisfactory, the drug appearing to act as a renal irritant as well as a diuretic, and was unsuitable in acute cases. The same was true of diuretin. It was impracticable to flush out the kidneys in acute nephritis, but there was a risk in diminishing the intake too much. Hot-air baths had definite limitations; they were only useful if followed by diuresis. For haematuria he found no drug of certain value. With dry cupping his experience had been unfortunate. Venesection was valuable for cases not doing well and most efficacious for convulsions.

Pathology, Its Bearing on Etiology.

Lieutenant J. SHAW DUNN, R.A.M.C., recounted his clinical experience of nephritis in France in the casualty clearing station zone. No composite picture of the symptoms could be drawn, but a fairly clear group could be selected as characteristic. The patients, on admission to hospital, regained very rapidly the appearance of health, showing little anaemia or loss of flesh. Dyspnoea was very common, but not urgent. The amount of urine was usually considerable, and was seldom diminished. The amount of albumin was at the onset usually 2 to 4 parts per 1,000, but in some cases was 8 parts per 1,000, and higher figures had been met with. In spite of this the urine was clear, and was not usually smoky. The casts were commonly hyaline and epithelial; blood casts were uncommon. Rapid improvement was the rule, the albumin practically disappearing in a few days. There was usually no fever. In some cases blood was passed in considerable amount, when fever was often associated. He was at a loss for any general cause. Against an infective process, like scarlet fever, was the fact that although the troops were in close contact with civilians the latter were unaffected. There was nothing to support the view that the ground was infective in particular areas.

He had studied with Captain McNee the pathological anatomy in 24 cases in all, of which 17 acute cases and 2 subacute cases were of the kind of nephritis under discussion. Little could be detected by the naked eye, except that on the cut surface of the cortex the glomeruli projected slightly as grey translucent nodules, instead of the red points seen normally. Microscopically the tubules did not show constant alterations; catarrhal changes were, however, indicated chiefly by mitoses in the cells; fatty changes were seen in some cells. Tubular haemorrhages also appeared. The main changes were found in the glomeruli. They were enlarged, and often pouted into the tubules, their cell content being increased. The glomerular capillaries were dilated, but instead of containing blood were filled with endothelial cells. Desquamation of the covering epithelium and proliferation also were sometimes present. There was little evidence of reaction of the stroma or adhesion of the tufts to Bowman's capsule. Leucocyte infiltration and degeneration were also absent. In two cases total infarction of some of the tufts was found, due to occlusion of the afferent arterioles by hyaline thrombi. Special examination of the organs had failed to give any evidence of a bacterial cause. Striking lung changes were found, which, it was suggested, threw a new light on the etiology; they were found to be acutely emphysematous and oedematous and to contain diffuse patchy haemorrhages. Microscopic examination of the lungs showed a peculiar lesion of the walls of the infundibula and ends of the bronchioles. These were prominent and were denuded of their epithelium, the surface being covered by dense fibrin; thus they had the appearance of having been cauterized. The changes found resembled those following the inhalation of chlorine or other irritant gases. In the lungs from seven cases of trench nephritis these changes were found, and in three of these the condition was well marked. In six out of the seven there was evidence of thrombosis of the pulmonary capillaries in relation to the infundibular damage. Numerous small haemorrhages occurred in the spleen and brain in two cases, and were apparently embolic in origin. The explanation appeared to be that the haemorrhages were the result of multiple embolisms, and this suggested that the kidney lesion was similarly caused, although no thrombi had been found in the glomeruli. In shell-gas poisoning the lung condition was very similar, and thrombosis of the pulmonary capillaries and cerebral haemorrhages of embolic origin also occurred. In one case of gas poisoning the kidney contained thrombi in the glomerular capillaries; in another there were no thrombi there, but proliferation of the lining endothelium of the glomerular capillaries had occurred—a condition similar to that present in the kidneys in trench nephritis. It was reasonable to suppose that thrombi had previously been present, and that the endothelial proliferation represented the resulting reaction. Although it was not suggested that the nature of the irritant which caused nephritis was drift gas or shell gas—and there was no history of recent "gassing" in the cases—it seemed likely that the origin of this form of nephritis was to be ascribed to embolisms blocking the glomerular vessels, and it might be that the source of the embolisms was to be found in the lung lesions, which were of the kind recognized as due to an inhaled irritant.

Discussion.

Mr. W. H. JESSOP said that of 75 cases he had found that 70.7 had retinoedema with the occurrence of plaques and sometimes of detachment of the retina. There were few haemorrhages; 56.6 per cent. of the patients were between 20 and 30 years old. The vessels were unaffected, and the blood pressure normal. All these changes could be watched from time to time and be seen to disappear. He could not but conclude that they were due to toxaemia as also was the oedema elsewhere.

Dr. J. E. ADLER said that he had met with blood casts on several occasions. He regarded the diastase test as of the utmost value. In acute nephritis there was generally a low diastase reading. In 800 readings it varied from *nil* to 40. In the majority of cases a diastase value consistently low was evidence of low renal efficiency. Of 69 cases with a low diastase value, 31 showed blood in the urine and 38 no blood; occasionally blood was found with a high diastase reading. The phthalein test was the most valuable. To perform this 6.6 mg. of phthalein were injected intramuscularly, and the bladder emptied one hour and ten minutes later, and every hour up to three or four hours. The test depended upon the amount excreted at the different hours. The amount excreted during the first hour should equal the total of the amounts passed at the end of the second and third hours. It agreed with the diastase reaction in showing that the permeability of the renal cells was markedly decreased in nephritis, and it

also indicated the advent of uraemia. The diastase readings and the phthalein test results were generally in agreement, but there were instances when the test was more reliable than the diastase value. The disadvantages of the diastase test were that a twenty-four hours specimen was necessary, the readings were variable, much time and special apparatus were required, and the starch had to be made fresh every day. Its use was somewhat restricted to laboratory work. He thought that both tests should be done in every case to enable a decision to be arrived at as to what should be done with the patients.

THE ROYAL SOCIETY.

November 9th, 1916.

Methods of Raising a Low Arterial Pressure.

Professor W. M. Bayliss, F.R.S., said that when the arterial pressure was low from loss of blood it could not be brought back, except to a certain degree, by the injection of saline solutions into the veins in quantity equal to that of the blood lost. But if the viscosity of such solutions were made equal to that of blood, a return to normal height was possible. The effect of saline injections containing gum or gelatine was also much more lasting than that of simple saline solutions. The difference in this respect was due to the osmotic pressure of the colloids added, by which loss of water by the kidneys or to the tissues was prevented. Solutions containing gum did not produce oedema in artificial perfusion of organs. When the fall of blood pressure was due to peripheral vaso-dilatation, then gum or gelatine solutions, although more effective than pure saline, produced a much less permanent rise than in cases of loss of blood. No signs of heart failure could be detected, and the reason why increase of pressure initially produced disappeared again more or less rapidly was still obscure. The combination of a small dose of barium chloride (1 mg. per kilogram of body-weight), as recommended by Langley, with a moderate amount of gum solution, was found to be the most satisfactory method in such cases. No diminution of reflex excitability resulted. The view that fall of arterial pressure produced peripheral vaso-constriction by means of nervous channels, and that rise of arterial pressure produced vaso-dilatation, was confirmed by artificial perfusion of a limb.

The Phagocyte in Cerebro-spinal Meningitis.

Dr. Cresswell Shearer, F.R.S., and Dr. H. Warren Crowe had, as the result of a number of experiments with freshly-drawn spinal fluid obtained from lumbar puncture of cerebro-spinal fever patients, in which the leucocytes had been shown to be alive (by trypan blue staining and observation on the warm stage), obtained good evidence that the meningococcus could be taken up by human leucocytes in large numbers and retained by them for some considerable time without undergoing digestion. They had succeeded in recovering living germs from the leucocytes of a number of such cases. It was well established that in the case of freshly isolated strains of the meningococcus the leucocytes would not take them up at first; although exceptions to this rule were said to occur (Kolle and Wassermann), the authors met with none. In the case of old laboratory cultures, on the other hand, ingestion on the part of the phagocytes took place with great rapidity. In a short time the germs were killed and completely digested by the leucocytes. This was also found to be the case with the majority of nasal strains of the meningococcus obtained from chronic "carriers," although there are great individual differences in this respect. It was shown experimentally that in the intermediate stage between the fresh spinal condition and the nasopharyngeal state they could be taken up but not killed by the leucocytes. They could be recovered from these leucocytes after periods of twenty-four, forty-eight, or even sixty hours and grown on artificial media. The conclusion, therefore, was that infection was by leucocytic conveyance. This, it was suggested, might be the reason why direct infection was so uncommon in cerebro-spinal fever. The virulent organism was insusceptible of being attacked by the phagocytes. The longer the germs grew in the "carrier" throat, the more easily would they be ingested, until a time was reached when, on ingestion, they were also destroyed. Somewhere between these two extremes infection might produce the disease. The organism was sufficiently weakened to give in to the leucocytic attack, but not to lose its life. Should infection take place at this point the leucocytes would pick up the germs from the mucous membrane of the nasopharynx, and in the course of their wanderings would sometimes carry them into the spinal canal. There the liberated organisms might set up the disease, at the same time reacquiring the power of resisting the attack of the leucocytes in the presence of normal serum.

Reviews.

RUTHERFORD MORISON'S COLLECTED CONTRIBUTIONS.

The two volumes entitled *Surgical Contributions*[1] consist of a collection of Mr. Morison's monographs, his views expressed on various surgical subjects in the *Medical Annual*, and his published remarks made at various medical society meetings; their appearance in book form is due to pressure from his old house-surgeons, to whom the work is dedicated. The author has brought his views up to date by the insertion of numerous footnotes throughout the book, but it is noticeable how successfully his writings have stood the test of time, for he has little either to add, or to retract, even from opinions published twenty to thirty years ago.

Among the opinions he still warmly maintains may be mentioned—that pyloroplasty is the best operation for a simple stricture of the pylorus; that in certain cases closure of the gall bladder is preferable to drainage of the viscus after the calculi have been removed; that primary periosteal sarcoma is rare, and that such new growths—probably *all*—commence in the medulla of the bone; that in tumours of the stomach and intestines, for mechanical reasons alone, it may be justifiable to excise non-localized malignant growths; and that the wound of a major operation should be allowed to heal under a single dressing.

The range of subjects is large and few areas of the wide field of general surgery are untraversed. His large experience in gastro-intestinal, gynaecological, genito-urinary, mammary disorders, in aneurysm, ruptured knee cartilage, and in bone and joint lesions, in tuberculosis generally, and in plastic surgery, justly entitle his remarks to the serious consideration of the reader. And his opinions have the backing of many groups of his own statistics.

We are impressed with the vast amount of original work he has contributed towards the solution of surgical problems, and it is interesting to read many views expressed by him far ahead of their general adoption; some of them are only now obtaining common acceptance. He was the first to point out the importance, for surgical drainage purposes, of the peritoneal recess now known as "Morison's hepato-renal pouch"; he also pointed out the folly of performing an ileo-colostomy only, where a new growth of the colon is situated between the end of the ileum and the point of anastomosis, without arranging for an escape from the distended caecum, as the usually competent ileo-caecal valve is the cause of the final bursting of the caecum from tension gangrene.

Included among operations and surgical measures he has introduced are the vertical incision for thoracostomy in an empyema; a new method of anastomosis of the lower pelvic colon after excision of a portion of bowel for new growth; the transverse abdominal wall incisions for exposing the liver, external bile passages, and the kidney; retrograde catheterization as an aid to localizing the bladder end of the urethra in a perineal cystostomy for stricture of the urethra, with retention of urine; excision of the elbow-joint and hip-joint; and the "keel operation" for radical cure of a ventral hernia. He was the first surgeon to open the peritoneal cavity deliberately for excision of a new growth of the bladder. The first successful case of omentopexy was done by him; the priority of suggesting this operation belongs to Professor

[1] *Surgical Contributions from 1881 to 1916.* By Rutherford Morison, M.B., F.R.C.S.Edin., F.R.C.S.Eng. In two volumes. Bristol: J. Wright and Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd. Toronto: The Macmillan Co. of Canada, Ltd. 1916. (Med. 8vo. Vol. i, pp. 439, 41 plates, 83 figures; 15s. net. Vol. ii, pp. 955, 18 plates, 113 figures; 30s. net. 42s. net the two volumes.)

Talma, although Mr. Morison quite independently devised the measure to cure the ascites by the formation of a new circulation.

The author's teaching aims primarily at the attainment of a thorough grasp of the principles in surgery; these essentials are put in a clear, helpful way, and their appreciation is a distinct asset in war surgery, which is apt to present unexpected problems. Much thought must have been devoted to the enunciation and collection of aphorisms on general surgery, of which large numbers are given; these are in themselves a mine of epitomized information. Mr. Morison urges upon his students the importance of schematically approaching any operation in the fullest detail, if they are not to get into difficulties and if uniformly successful results are to be attained. A quotation which has been aptly applied to Professor Morison in his teaching and professional work is "that without forethought there can be no precision"; the authorship of this quotation we cannot trace. He is a well-known advocate of an ample incision to enable the surgeon always to see what he is doing, for he holds that considerable danger attaches to surgery done otherwise.

He groups as many diseases as possible under a common heading, and he teaches that in their main points the pathology, symptoms, diagnosis, prognosis, and treatment in all these groups are the same. Such groups include: (1) *Stricture* of the common bile duct, pylorus, and urethra; (2) *tension gangrene* of the gall bladder, urinary bladder, appendix, and caecum; (3) *sacculi* of the gall bladder, urinary bladder, appendix, and colon; (4) *torsions* of the different abdominal viscera. The description and illustrative diagrams of the different situations in which a pathological vermiform appendix may be found are exceptionally good, as are those relating to gall stones and intestinal obstruction. The book bristles with pathology, which enters largely into every surgical problem discussed.

A house-surgeon particularly will find much valuable information on the requisites for an operation, the preparation of a patient, and after-treatment, and on the various complications that may arise.

The volumes are well got up, the paper and print being good, and the value of the book is much enhanced by an ample index whereby the author's views on a subject may be speedily ascertained. There are a large number of diagrams and illustrations, including a photograph of Mr. Morison surrounded by all his old house-surgeons. Although the work is not a student's textbook, we venture to predict that it will be widely read, and used also as a book of reference by both clinician and pathologist, be he student, general practitioner, or consultant.

We congratulate the author, and look for further written records of his vast experience.

PHYSIOLOGICAL CHEMISTRY.

IN his textbook on *Physiological Chemistry*,[2] Professor A. P. MATHEWS, of Chicago, attempts to cover the ground of both theoretical and practical biochemistry. The first part of the book, occupying about a quarter of the whole, is devoted to the chemistry of protoplasm and the cell. The amount of space given to the discussion of the carbohydrates, lipins (fats, etc.), and the proteins is well disposed, for the author enters into chemical considerations which are not as a rule fully treated in such textbooks as this. The chapter on the physical chemistry of the protoplasm is also valuable and interesting, for the subject is one to which the author has given special attention. This first part of the book is particularly useful, since it deals with subjects of fundamental importance in a clear, original, and comprehensive manner. The rest of the book is more commonplace. It is devoted to the growth, maintenance, and energies of the mammalian body considered as a machine. Here, in his chapter on the glands with internal secretions, the author takes the opportunity to give them the new name "cryptorhetic organs," on the ground that "they are the tissues of hidden flowing," as he says. The volume ends with 160 pages on practical work and methods—an amplification of the schedule of work in physiological chemistry in use at the University of Chicago. Professor Mathews has collected many facts and hypotheses in his book, and presents them to the reader in a style that is at times a little tedious; the text would gain by passages of lucid summarization. Thus his explanation of the clotting of blood takes a whole page of exposition, being itself preceded by over twenty pages of preliminary explanations; its depth may be judged from the fact that he assumes the blood platelets to be liquid crystals composed of protease, fibrin, phospholipin, thrombin, calcium, and antithrombin. Nearly two pages of the book are taken up with explanations of how and why the brain and nervous system are the "master tissues of the body"—a matter which seems alien to the study of physiological chemistry.

The book is described as a textbook for students, but the opening words of the preface in which the author expresses the hope that it "may raise in the minds of those who read it more questions than it answers" shows that its appeal is not so much to the ordinary student as to those who intend to devote themselves to physiology and pathology, or to the physician who is prepared to give special attention to the study of metabolism. To such persons its value will be greatly increased by the fact that the author has appended to his chapters selected bibliographies of the subject with which each deals. He has also supplied an excellent index.

[2] *Physiological Chemistry: A Textbook and Manual for Students.* By A. P. Mathews, Ph.D. London: Baillière, Tindall, and Cox. 1916. (Roy. 8vo, pp. 1050: 76 figures. 21s. net.)

NOTES ON BOOKS.

THAT eminent surgeon and experimentalist Professor G. W. CRILE has recently developed views as to the mechanism of life that were expounded in a lecture delivered last year in America. A fairly full account of the doctrines will be found in the BRITISH MEDICAL JOURNAL of October 28th, 1916, p. 590. Professor Crile has now published a more detailed account of his views, with the facts and fancies upon which they are based, in book form.[3] He has also published a little book[4] in which he applies his ideas of the development and phylogeny of man to war and peace. In these two volumes the reader has the opportunity to study the evidence upon which the author bases his far-reaching views on the kinetic drive and the mechanical or chemical basis of life. In place of the old-fashioned tripod of life, he gives us a five-legged stool, with the brain, the adrenals, the liver, the thyroid, and the muscles as its supports. For ourselves, we find the seat uneasy, and perusal of the books exacting. Yet all attempts to solve the riddle of life are interesting, and Professor Crile's works have all the value attaching to the writings of a highly competent experimental physiologist.

The essential feature of Major WALTER'S *Guide to X Rays, Electro-Therapeutics, and Radium Therapy*[5] is that the author has compressed into a few pages the salient facts and features of electrical treatment, radiography, the action of x rays on various tissues, and the action and uses of radium. The illustrations, some original, many drawn from various publications, are well chosen; and the amount of practical information, without elaboration of detail, is somewhat remarkable. As an elementary treatise, which is all it professes to be, it is altogether admirable, and should be of much use to students, and especially to those who are commencing a course of instruction in these subjects. No attempt is made to enter into elaborate discussion as to either diagnosis or treatment, broad principles alone being dealt with, but little of importance is missed, and the whole is put together in a very practical manner, is easily understood, and is well arranged and well written. Inasmuch as most textbooks on the subject are of large size, and appeal more to the advanced student, this publication seems to fulfil a useful purpose as an elementary introduction to the various subjects. It should appeal especially to house-surgeons, to general practitioners, and those attending for the first time a course of instruction in x rays and radio-therapeutics.

[3] *Man, an Adaptive Mechanism.* By G. W. Crile, F.A.C.S.; edited by Annette Austin. A.B. New York: The Macmillan Co. 1916. (Demy 8vo, pp. 403; 88 figures. 10s. 6d. net.)

[4] *A Mechanistic View of War and Peace.* By G. W. Crile; edited by Amy F. Rowland. London: T. Werner Laurie, Limited. 1916. (Post 8vo, pp. 116; illustrated. 6s. net.)

[5] *A Practical Guide to X Rays, Electro-Therapeutics, and Radium Therapy for Students and Practitioners.* By A. E. Walter, M.R.C.S., L.R.C.P., Major I.M.S. Calcutta and Simla: Thacker, Spink, and Co. 1916. (Demy 8vo, pp. 253; 144 figures. 10s. 6d. net.)

The monograph on the *Roentgenographic Diagnosis of Dental Infection in Systemic Diseases*[6] by Dr. TOUSEY, of New York, is an elaboration of many articles published by the author during 1916. The *x*-ray illustrations of teeth showing abscess formation, pyorrhoea, and conditions from which these are to be differentiated are good. It is suggested that a putrescent mass in the pulp chamber of a tooth may be present for years and be the source of long-persisting secondary infection, and the cause of such diseases as gastric ulcer, exophthalmic goitre, cardiac lesions, and many other conditions of which the initial cause is obscure, and that in all such conditions an *x*-ray examination of the teeth may be useful.

[6] *Roentgenographic Diagnosis of Dental Infection in Systemic Diseases.* By S. Tousey, A.M., M.D. New York: P. B. Hoeber. 1916. (Fcap. 4to, pp. 87; illustrated. 1.50 dols.)

MEDICINAL AND DIETETIC PREPARATIONS.

Néocaine-Surrénine.

NÉOCAINE-SURRÉNINE, samples of which have been submitted to us by the Anglo-French Drug Company, Limited, Gamage Buildings, Holborn, is a new local anaesthetic which is intended to replace cocaine, novocaine, etc., in dental practice and in all operations in which these substances have been employed. It is a white crystalline powder, readily soluble in water, and is stated to consist of a compound termed néocaine, which is described as a synthetic compound of the "benzoyl-dimethyl-ethyl series," together with 0.2 per cent. of "acid borate of adrenalin," the latter being the natural and not the synthetic variety. It is claimed that néocaine is much less toxic than cocaine, and also that the anaesthesia produced by it is much more prolonged, lasting from half an hour to an hour and a half. Néocaine-surrénine is supplied in powder form (in tubes containing twenty capsules each holding 0.050 gram, and in tubes containing 5 grams and 1 oz. respectively), and also in ampoules of various sizes containing sterilized solutions of convenient strengths. Ampoules of isotonic saline solution are also supplied for the purpose of preparing sterile solutions of the powder as required.

Forma-Germkill Fumigators.

We have recently received samples of the Forma-Germkill Fumigator, manufactured by the Central City Chemical Co., Chicago, Ill., U.S.A. (London agent, Mr. L. Warner, 1 and 3, Jewin Crescent, E.C.), and intended for fumigating sick-rooms, schools, hospitals, etc., with moist gaseous formaldehyde. They consist of a metallic cup holding a solid compound stated to contain at least 72 per cent. of real formaldehyde, together with a simple burner, burning solid fuel, by which the vaporization is effected, the two being sealed together in such a manner as to be airtight, while at the same time the fumigator is very easily opened. When used according to the directions supplied we find that the fumigators yield a steady stream of gaseous formaldehyde together with amply sufficient water vapour to ensure that the disinfectant will exert its full germicidal activity; at the same time, there appears to be no danger of fire if the precautions directed are taken. The fumigators are supplied in various sizes, the smallest containing 1 oz. of the solid formaldehyde mixture, and being stated to be sufficient for the disinfection of 1,000 cubic feet of space.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the committee, held on Tuesday, November 14th, thirty-five cases were considered, and £303 voted to twenty-nine of the applicants. The following is a summary of some of the cases relieved:

Daughter, aged 54, of M.R.C.S.Eng. who practised at Hadleigh. Applicant was a governess for thirty-three years, but, owing to a breakdown in health, had to discontinue the work. Income, £18 from dividends and £21 pension from another society, and earns a little by needlework. Owing to high price of food unable to manage at present. Voted £2 last month, and referred to the Guild. Voted £12 in twelve instalments.

M.R.C.S.Eng., aged 47, married, who practised at Birmingham, suffering from disseminated sclerosis. Until recently was able to earn a bare living by acting as ship surgeon, but now too ill to undertake work of any kind. One son, aged 9, and wants help towards his education. Voted £18 in twelve instalments.

Widow, aged 63, of M.R.C.S.Eng. who practised in Suffolk and Cambridge and died in 1904. Left quite unprovided for, and until recently earned a bare income by acting as nurse companion. About four months ago became ill, and is now suffering from paralysis, and the small amount of money saved is almost exhausted. Voted £2, and referred to the Guild.

Widow, aged 70, of L.R.C.P.Edin. who practised at Cardiff and died in 1906. Was left totally unprovided for, and is now a chronic invalid. Only income two pensions from other societies of £54. Two children married, and unable to help. Relieved eleven times, £82 10s. Voted £6 in twelve instalments.

Widow, aged 79, of L.S.A.Lond. who practised in Suffolk and died in 1878. Left unprovided for with a large family, none able to help. One daughter assists in the home. Only income a pension of £30 from Epsom College. Relieved four times, £22. Voted £12 in twelve instalments.

Daughter, aged 83, of M.R.C.S.Eng. who practised at Newton Abbot and died in 1839. Was a governess for many years. Income from two annuities £70. Was an annuitant of the Fund for many years, but this was discontinued. Relieved last year, £20 in four instalments. Voted £8 in two instalments.

Daughter, aged 66, of M.D.Edin. who practised at Spalding and died in 1895. Applicant was left with insufficient means, and is now too old to get employment. Only income £34 per annum. Relieved once, £12. Voted £12 in twelve instalments.

Widow, aged 59, of M.D.Glas. who practised in Perthshire and died in 1907. Was left unprovided for, and is now practically blind. Son who used to help to keep the home now in the army. Two other sons married, and unable to help. Relieved twice, £12. Glasgow Branch of the Guild strongly recommend this case. Voted £10.

Widow, aged 79, of M.D.Lond. who practised in Wimpole Street and died in 1895. Applicant was left with very slender means, total only £44. Suffers from rheumatic gout. Relieved nine times, £55. Voted £10 in two instalments.

(*To be continued.*)

DISABLED SAILORS AND SOLDIERS.

SCHEME OF THE BIRMINGHAM PENSIONS COMMITTEE.

WHAT is, we believe, the first scheme of a local pensions committee for the care and training of disabled soldiers has been sent in, adopted by the Birmingham Local Pensions Committee, and transmitted to the Central Statutory War Pensions Committee. It was adopted at a meeting presided over by the Lord Mayor, Mr. Neville Chamberlain, on November 14th.

A register of all disabled sailors and soldiers in the city has been compiled and will be maintained. The scheme assumes that arrangements for domiciliary treatment of all insured men will be made under the Insurance Act, and that uninsured sailors and soldiers will have equal rights with insured men for domiciliary treatment, medicines, and appliances. It recognizes that in certain cases ordinary treatment must be supplemented by specialist consultations, or special treatment, and that this may involve arrangements to provide institutional treatment. This is the crux of the situation for the moment. The Birmingham scheme proposes to arrange with certain institutions in Birmingham to receive and treat as out- or in-patients disabled soldiers sent by the Local Pensions Committee. It proposes to make such arrangements with the General Hospital, the Queen's Hospital, the Royal Orthopaedic, the Eye, Ear and Throat, Skin and Lock, and Dental Hospitals in Birmingham. The War Office has arranged that discharged men who have undergone amputation shall attend as out-patients for further treatment at the 1st Southern General Hospital and the Dudley Road Military Hospital. It is believed that St. Dunstan's Home at Regent's Park is at present in a position to deal with all cases of blindness, and that cases of partial blindness should be sent for treatment to a local eye hospital. It is hoped to make arrangements with the Education Committee and the institution at Edgbaston for teaching lip reading or some other mode of communication to cases of deafness. It is pointed out that it is the duty of the City Council to provide for the treatment of cases of tuberculosis.

The difficulty of equipping and training a disabled man to earn his own living so that he shall not be left to become a burden to the community and possibly to himself is recognized, but it is said that local experience shows that a good proportion of discharged men have returned to their former occupations, or obtained other employment without resorting either to the Citizens' Committee or the Labour Exchange; it is assumed that as time goes on and the number grows some among them will be unable to find employment by reason of physical injury or disease. For the training of such men technical schools in the city could be utilized, and there is reason to believe that arrangements could be made with many workshops to secure training; it is therefore proposed to make arrangements both with the Education Committee and with employers in various industries to afford opportunities of practical workshop training. It is the duty of the Labour

Exchange to report each week to the Local Pensions Committee particulars of discharged men who have been placed in employment, and also of men who, within a fortnight of the date of their registration with the Exchange, have not been found employment. The committee has informed the Labour Exchange that it is now ready to receive information on these heads. Altogether 1,556 cases for treatment have been reported to the committee, and in the third quarter of the year 273 applications for training and employment were received.

We are glad to see that the Birmingham committee has taken a definite line with regard to soldiers suffering from some permanent disability, such as paralysis, which makes them bedridden or at least reduces them to a condition of helplessness requiring constant attendance. The Central Statutory War Pensions Committee appears at first to have thought that such cases might be disposed of by asking the ordinary civil general hospitals each to take a few, and approached the hospitals accordingly. Such a proposal ought not, we think, to be entertained, for its acceptance would mean the exclusion of ordinary civil patients for whom the hospitals primarily exist. The Star and Garter Home at Richmond has been established under the auspices of the Red Cross Society for helpless cases, but apart from the fact that its accommodation is limited, it would be undesirable and contrary to the wishes of the men themselves to assemble all such cases in one home or hospital, which must be situated at a distance from the relatives and friends of many of them. The Birmingham committee accordingly suggests that it may shortly become necessary to provide a local home, and asks the district committees to furnish particulars of cases suitable for admission. The way in which such a home should be provided and maintained is not discussed by the committee, but it is clear that the obligation to care for such men falls primarily upon the State. This has been recognized by the Government, although there seemed to be a disposition to think that the State pensions or allowances should be supplemented out of voluntary funds placed at the disposal of the central or local pensions committees.

The Birmingham committee recognizes that every disabled man should be in a position to obtain the medical assistance and treatment that he requires, that if training is needed the treatment and training should proceed together, and that in many cases the treatment will have to be of a special character. The decision as to the kind of treatment and training which will be most beneficial is a medical question, as is also the selection of cases suitable for admission to homes for permanently helpless soldiers; in both cases medical knowledge is necessary, and in coming to decisions on these matters local pensions committees should have the assistance of medical members. In the original scheme propounded under the Act the mistake was made of not requiring all local pensions committees to contain a medical element, and it was even said that the local pensions committees had no medical functions. This showed an imperfect understanding of what the duties of these committees would be, and the defect is, we hope, on the way to be remedied. The sooner the remedy is applied the better, and it may be suggested that the matter is one in which it is desirable that the profession should take action locally.

Second Reading of the Board of Pensions Bill.

The discussion which took place on the second reading of the Board of Pensions Bill on November 21st did not throw much new light on the problem.

Mr. Hayes Fisher, Parliamentary Secretary to the Local Government Board, who moved the second reading, said that while it would have been easy to have established two years ago a single pensions body, it would be difficult now, for the staff reached a total of 2,500, the number of widows was 50,000 and of orphans 100,000, and it was considered that it would be a pity to transfer the allegiance of the 300 local pensions committees from the Statutory War Pensions Committee to a new department. The bill for the first time set up a Pensions Minister, who was a member of the Cabinet, and a strong board, and he hoped that before long the Admiralty would come in. He stated that there were now over 70,000 disabled men, and it was a duty to see whether there were not many men who had been refused a pension who ought to have some form of grant or compassionate allowance. The local pensions committees should form a complete register of every widow, orphan, and dependant, and every disabled and discharged man.

Sir H. Craik, though expressing himself in sympathy with the objects of the promoters of the bill, formally moved its rejection. He did not consider it necessary to suspend all the important functions of the Statutory Committee and introduce a new executive authority. It would be necessary to establish credit banks for soldiers, to build up lost credit and re-establish good-will, and he feared that the Pensions Minister could not take that task up. Major H. Terrell, who seconded, urged that the Government should tear up the Royal Warrants and establish a system under which there would be no delay between the time when the rate applicable to a particular man was fixed and the day when he got his money. Sir C. Henry protested against the slight put upon the Statutory Committee, but Mr. Percy Harris pointed out that it would continue to exercise one most important and vital duty, that of the care of disabled men.

The Financial Secretary to the War Office defended the bill on the ground that simplification and unification were needed, and could not be carried out by the War Office, which did not possess the necessary local machinery. After a number of other members had criticized the bill, the Minister of Pensions, Mr. A. Henderson, said that the existing warrants must be replaced by a system which would act not only more promptly, but more fairly and even more generously. Before the war was over he believed that if the matter were put on a proper basis, ten or fifteen, or even twenty millions a year would be required for disability pensions alone. If it had been possible to start with a clear field, a different course might have been taken, but Parliament had been two years late in laying its plans. He was in favour of flat-rate pensions, and thought it would be possible, in the case of men disabled, or whose disability or illness had been aggravated by war service, to devise a plan by which, if the soldier's pay and separation allowance were not continued in the present form, recuperating grants might be made for a period not exceeding twelve months, at the end of which period a man could be put on a pension. If a man had the germs of disease when he enlisted, he was nevertheless able to perform his duties as a producer and citizen, and the State had an obligation to such a man.

Sir Henry Craik withdrew his amendment, and the bill was read a second time without a division.

Training and Notification.

In the discussion which preceded the first reading of the Board of Pensions Bill Mr. Hogge said that he believed the right thing to do was for the War Office to retain under military discipline all men until they were fit, or as fit as possible, to be restored to civil life. Mr. Henderson said that no decision had yet been reached by the War Office on that point; what was contemplated was that training might be begun when later stages of the cure were being effected, but he did not think there was any intention of carrying the training to the extent it might be carried if the work was taken up by the War Office or left to be carried out by the Statutory Committee or any other authority. It was a sort of introductory stage. In a written reply to another question, Mr. Forster said that information as to soldiers about to be discharged from military hospitals was given to local committees and should reach them fourteen days or more before the man's discharge.

COMPULSORY NOTIFICATION OF VENEREAL DISEASES AT THE PRESENT TIME.

A VERY strong committee of the British Medical Association, consisting of all the chairmen of Standing Committees, with the Chairman of Council in the chair, considered this question, and has authorized the following statement for publication.

The Committee of Chairmen of the Standing Committees of the British Medical Association, after very careful consideration, has unanimously arrived at the conclusion that any system of compulsory notification of venereal diseases at the present time would entirely fail to obtain the results desired, for the following reasons:

(1) That it would lead to concealment; and

(2) That even if a public authority were notified that any particular person was suffering from one of these diseases, no effective measures could, in the large majority of cases, be taken for treatment.

The Committee considers that the time for any such procedure has not yet arrived, and that before considering how it might be carried into effect it will be necessary to provide facilities for free treatment in accordance with the scheme set out in the circular issued by the Local Government Board, and also to prevent afflicted persons while in an infectious state from resorting to unqualified and incompetent persons for treatment, by rendering any such treatment, or the advertisement or sale of quack remedies, an offence against the law.

British Medical Journal.

SATURDAY, NOVEMBER 25TH, 1916.

FRESH LIGHT ON TRENCH NEPHRITIS.

In a paper published last January[1] Sir John Rose Bradford gave the results of a study of the special case sheets of 1,455 cases of trench nephritis under treatment at various periods in the base hospitals of the British Expeditionary Force in France. The disease was, he said, characterized by five features: The rapid subsidence of well marked renal dropsy, the frequent presence of bronchitis and dyspnoea, the severity and suddenness of the onset of uraemic manifestations such as epileptiform seizures, the rapidity with which inflammatory complications occurred, and the low mortality, which had not exceeded three or four per 1,000. In a discussion held at the Royal Society of Medicine in February,[2] Dr. Langdon Brown said that usually oedema was the first symptom, often accompanied by shortness of breath, that bronchitis was common, and that a fair proportion of patients had complained of sore throat. He recalled the facts that over 14,000 cases had occurred during the American Civil War, the incidence of the disease being specially great in the course of one year (March, 1862, to March, 1863), and that the epidemic did not recur in later years of the war. Dr. F. W. Andrewes, who had only been able to examine cases in a later stage, found typical evidence of acute nephritis, the specimens showing in the glomeruli proliferation of the epithelium of the capsule, and in the tubules degeneration and desquamation of the epithelium. There was also some cellular infiltration in the interstitial tissue. The condition, he said, was comparable in all respects with the acute glomerular nephritis of scarlet fever. Dr. R. G. Abercrombie, from an examination of 500 cases in the acute phase, concluded that in about half of them there were premonitory symptoms which in order of frequency were bronchitis, febrile symptoms, and abdominal pains and vomiting.

In a highly complex organ such as the kidney, alterations which have been initiated by any process producing acute damage tend to progress, until finally the appearances present little that is characteristic of the commencement of the disorder. In order to grasp the fundamental lesion, it is necessary to examine acute cases at the earliest period. This has now been done by Lieutenant J. Shaw Dunn, working in conjunction with Captain McNee, on the kidneys of an extensive series of acute cases of trench nephritis seen in the casualty clearing station zone. A report of this investigation will be found at page 724. That material was secured from cases in a very early stage of the disease is shown not only by the clinical histories, but by the nature of the lesion. The constant and outstanding pathological feature in these cases has been the plugging of the glomerular capillaries with masses of cells, apparently of endothelial origin, so that the tufts were greatly swollen and their vessels rendered practically impervious to the blood stream. Tubular changes, on the other hand, were inconstant, and when present were mainly reactive, as shown by the occurrence of mitoses in the epithelial cells. Thus there is good reason for agreeing with the opinion expressed that the condition, so far as the kidneys are concerned, is essentially a particular type of glomerulo-nephritis (intracapillary capsulo-nephritis). The general absence in the acute cases of such phenomena as leucocyte accumulations and proliferation of the stroma or the lining epithelium of the glomeruli, points to the conclusion that these conditions, when present, are of the nature of secondary changes.

Remarkable lesions have been observed in other organs, especially the lungs and brain, and as the result of extremely searching histological investigations, the view is advanced that these changes afford a clue to the causation of trench nephritis. The lungs were examined in seven cases, and in three of these acute lesions were observed indistinguishable from those produced by the inhalation of irritating gases, such as chlorine or shell-gas; in the other four the changes were similar though less marked. The lesions consisted in total destruction of the epithelial lining of the terminal bronchioles and infundibula, with the deposition of fibrinous exudate on the denuded surfaces; there was often a superadded inflammatory reaction in the form of collections of polymorphs and lymphocytes. In the adjacent pulmonary capillaries hyaline thrombi were found in six out of the seven cases. The probability that a close connexion existed between these pulmonary thrombi and the glomerular changes in the kidney was established by the examination of peculiar punctiform haemorrhages in the brains of certain of the cases of nephritis and by the conditions found in the kidneys and brains of men who had died from gas poisoning. The punctiform cerebral haemorrhages in cases of both types were shown by serial sections to be due to hyaline plugs in the capillaries. In many of the haemorrhagic areas, however, the vascular plugs could not be found, and it is surmised that they may be extruded along with the red blood corpuscles. In the nephritic kidneys hyaline plugs were only rarely found in the glomerular vessels; but here the links in the chain are supplied by the appearances in two cases of acute poisoning by shell-gas which came to examination. Both showed the typical lung changes already mentioned, but, while the kidneys of the one presented hyaline plugs in the glomerular capillaries, those of the other showed instead some proliferation of the vascular endothelium in the tufts. Accordingly it is suggested that the proliferation of glomerular endothelium in trench nephritis represents the local cellular reaction set up by similar hyaline plugs, which are then probably disposed of by phagocytosis. This novel view of the kidney lesion as being in the first instance purely mechanical certainly affords an explanation of the extremely local and uniform character of the early change. Further, Lieutenant Dunn's statement that brain haemorrhages precisely similar to those recorded had been produced experimentally by non-toxic emboli is specially suggestive in this connexion, and seems to prove that the view that such vascular lesions must necessarily be toxic in origin is not tenable. The pulmonary changes are most significant in relation to the dyspnoea which is so prominent a feature of this type of nephritis and the bronchitis which so commonly attends it. According to the theory now propounded, the sequence of events would be as follows: Some irritant is inhaled; it causes acute damage to the terminal bronchioles and infundibula, which is accompanied by thrombosis in the pulmonary

[1] *Quarterly Journal of Medicine*, vol. ix, No. 34; British Medical Journal, 1916, vol. i, p. 351.
[2] British Medical Journal, 1916, vol. i, p. 278

capillaries. Thence the thrombi are transported as emboli to the capillaries of various organs, where they cause characteristic lesions in certain situations. In the brain they give rise to minute haemorrhages. In the kidney the emboli lodge in the glomerular vessels, cause reactive proliferation of the endothelium and so occlusion; the glomeruli, being thus deprived of blood, are thrown out of action and the symptoms of nephritis follow. It is, of course, clear that these suggestions are advanced with reserve, since it is acknowledged that the cases of nephritis gave no history of recent "gassing"; thus, since the nature of the inhaled irritant is so far undetermined, the primary character of the lung lesions in point of time remains more or less conjectural.

Hitherto no parasite has been discovered, although in the discussion last February Dr. Mackenzie Wallis stated that he had found that the injection of filtered urine from trench nephritis into rabbits and monkeys caused a severe illness after eight days, but that urine which had been heated to 55° C. produced no illness. These results were held to suggest that an ultramicroscopic filter-passing virus might be present. Meanwhile the theory put forward by Lieutenant Dunn, which is, as we understand it, that the primary lesion is in the lungs, merits the closest consideration, and would not necessarily be put out of court by the discovery of an infective agent. The observations constitute a most important contribution to morbid histology, and reflect great credit both upon the observer and the temporary laboratory in which the work has been done. They form an important contribution to the solution of the problem, and we hope that the inquiry will be continued, that it will embrace all aspects of the acute cases, and that it will include the study of the chemical questions which arise.

FOOD CONTROL.

THE decision of the Board of Trade, announced by Mr. Runciman on November 15th, to appoint a Food Controller, has naturally excited a great deal of public interest, and more has been read into the announcement than it actually contained. The Orders so far made by the Board of Trade under the Defence of the Realm Regulations apply to milk, flour, and potatoes. The price of milk must not be raised above that paid at November 15th, 1916, and the price may not exceed by more than a specified amount—in the case of retail milk 2d. a quart—the price in the corresponding month before the war. The order as to potatoes requires a return of potato stocks. The order which will have most effect in its influence on our daily diet is that which deals with flour. It affords an instance of how an agitation, unsuccessful in peace time, may succeed in its object under the stress of war conditions. The severe restriction of the hours during which alcoholic liquors may be sold, and the introduction of "summer time," or daylight saving, as it has been called, are other examples. The regulation prohibits for the future the production of any flour except such as would have been called a few years ago, when there was a considerable agitation for its adoption, "standard flour."

The relative advantages and disadvantages of the grinding of wheat so as to produce a flour containing a larger proportion of germ and bran than the ordinary white flour have been somewhat fully discussed in our columns. The prevalent method, in consequence of the preference of the public for a very white flour and very white bread, has been to grind the wheat and separate the product into a succession of fractions, the principal fraction, white flour, forming about 70 per cent. of the grain. By arranging the milling in such a way that 80 per cent. instead of 70 is collected in one fraction, the amount of protein in the flour is substantially increased, and it has been claimed that the product is increased in nutritive value not only by the enhanced amount of protein, but by the retention in it of a larger proportion of the vitamines of the embryo. Mr. Runciman appears to have been impressed by this view of the matter as well as by the advantage of getting an additional yield. He stated in the House of Commons that the Government had decided that 70 per cent. flour cannot now be permitted in this country. "Pure white flour," he said, "from which has been abstracted, as some people think, some of its most valuable qualities, will not be milled in future. We shall retain in the flour a good deal of what I believe in some quarters is called offal and in others precious food." He went on to state that the percentage of wheat which should be converted into flour varied with different kinds of wheat, and that a scale of percentages would be laid down which would, on an average, raise the yield of flour about 8½ per cent. The milling order which has since been published gives the percentage of flour that must be extracted from wheat as varying from 73 to 78 per cent. according to the variety, the highest figure being that for Australian wheat; the average figure is 75 per cent., which is still well below the 80 per cent. which was the percentage adopted for giving "standard flour." Even the additional 5 per cent., however, represents a large increase in the amount of flour obtained from every sack of wheat. The palatability of the resulting bread will continue to depend chiefly on a judicious blending of flours and on good baking.

While there may still be some difference of opinion as to the extent of the advantage secured, there will probably be no difference of opinion in the medical profession on the point that it will, in the existing circumstances of the food market, be considerable, even apart from the fact that a given amount of wheat will yield a much larger proportion of bread than before. In this case, as in the case of "summer time" and other innovations, it will be interesting to see whether the general experience obtained will lead to the retention after the end of the war of what has been adopted as a temporary measure.

CERTIFIED OCCUPATIONS AND THE POSITION OF THE MEDICAL PROFESSION.

THE Man-Power Distribution Board has issued a revised list (R. 105) of certified occupations, and tribunals and military representatives are instructed to observe it strictly. Special prominence is given to the instruction that men applying for certificates of exemption should be examined by a recruiting medical board before their cases come up for decision by the tribunal, and it is added that as there is great pressure upon the medical boards applicants should give early notice to the recruiting officer of their desire to undergo medical examination. Men lawfully and habitually engaged in dispensing medicines are to be treated as in a certified occupation, if agreed to be indispensable for the needs of the population by the military representative, after consultation with the Insurance Committee for the area, which must consult the Pharmaceutical Committee, or if recommended by the National Insurance Commission and approved by the Army Council. Analytical, consulting, or research chemists are to be treated as in a certified occupation if recommended by the Royal Society. Attendants on lunatics are to be treated as in a certified occupation if recom-

mended by the Board of Control. Officers of the administrative or technical staffs of local government authorities, except men under 25 years of age and certain others engaged in fire brigades, salvage corps, the lifeboat service, and the police force, are to be treated as in a certified occupation, to whose reservation the military representatives agree. It is notified that the list will be revised early in 1917, and the age limits again raised. The rule entitling men in certified occupations under the age limits to be treated as covered by the list if found by a recruiting medical board to be unfit for general service (Category A) will also be altered so as to make available for the army men found fit for garrison duty abroad (Category B (i)). The list does not apply to duly qualified medical practitioners, with regard to whom special regulations were made by the Order in Council, made under Section 7 of the Military Service Act, 1916 (Session 2). The Order was set out in the SUPPLEMENT of June 10th, 1916, and its operation fully explained in a memorandum issued by the War Office on June 7th, and published in the SUPPLEMENT of June 17th, 1916. The Director-General A.M.S. in a covering letter emphasized the fact that the scheme would depend for its successful working upon the support and co-operation of the whole profession. The Order and memorandum recognized the Central Medical War Committee for England and Wales, and the Scottish Medical Service Emergency Committee as statutory professional committees for the purpose of considering applications for certificates of exemption on any ground other than that of conscientious objection, made by medical practitioners to local tribunals, and local tribunals were instructed forthwith to notify the appropriate central professional committee that an application had been made. At the same time, the Committee of Reference appointed by the Royal Colleges of Physicians and Surgeons in England was recognized as the statutory professional committee for the purpose of considering cases of doctors on the staffs of hospitals and medical schools in the metropolis, and such other special cases in England or Wales as might be referred to it. It is now, we believe, generally understood that a medical man who has enrolled with the Central Medical War Committee or the Scottish Medical Service Emergency Committee need not apply to the local tribunal, and that to do so only introduces an unnecessary complication. It suffices for him to produce his certificate of enrolment, and refer the local authorities to Army Council Instruction 485. A Central Professional Committee—namely, the Central Medical War Committee for England and Wales, the Scottish Medical Service Emergency Committee, and the Committee of Reference for the special cases mentioned—has power to recommend exemption, absolute, conditional, or temporary, in cases in which, after considering the evidence, it thinks a certificate of exemption ought to be granted, and the recommendation of the professional committee concerned is binding on any tribunal under the Act. It is also now well known that doctors over 41, though not within the compulsory provisions of the Acts, are eligible up to 45 years of age for commissions in the R.A.M.C. for general service. Further, the War Office is prepared to give commissions in the R.A.M.C. to medical men between 45 and 55 willing to undertake whole-time home service. Every man who thus offers himself for whole-time home service will set free one younger medical officer now employed in this country to serve with the armies which the country has in France, the Mediterranean, Mesopotamia, India, and Africa. Communications from practitioners in England and Wales should be addressed to the Secretary of the Central Medical War Committee, 429, Strand, London, W.C., and from practitioners in Scotland to the Secretary of the Scottish Medical Service Emergency Committee, Royal College of Physicians, Edinburgh. The Secretary of the Committee of Reference is Mr. F. G. Hallett, Conjoint Board in England, Queen Square, Bloomsbury, W.C.

THE PROPOSALS FOR A STATE MEDICAL SERVICE.

THE great position of the *Times* and the manner in which it has added to it by its fearless criticisms of many matters relating to the conduct of the war and reconstruction afterwards lend particular importance to any articles published in it with editorial authority. We have been accustomed to look to the *Times* for well-considered pronouncements on matters of policy reached after very full consideration of the facts, and one secret of its influence is that it has habitually followed this method. We feel, therefore, bound to enter a protest against the manner in which the campaign it appears disposed to carry on for the establishment of a civilian state medical service in this country has recently been conducted. The proposal is clearly a matter suitable for public discussion, but the very fact of its great importance, not only to the profession but to the public, makes it all the more desirable that it should be handled seriously and with full recognition of the practical difficulties of the problem. In the series of short articles published in the *Times* recently there has been no attempt to define what is meant by a state medical service, nor to indicate even the general outline of a scheme; instead we have been treated to a series of sneers and innuendoes reflecting on the competence and good faith of members of the profession who have remained in civil practice in this country, and to general statements as to what that very large part of the profession now serving in the navy and army think and desire. We are in a position to affirm that no one is at the present time justified in making any positive statement on this head. What is definitely known is that before the war the immense majority of the medical profession in Great Britain was strongly opposed to a state medical service, but that among those who are serving abroad there has recently arisen a disposition to re-examine the question. The subject, as we have said, concerns the public as much as medical practitioners, if by a state medical service is meant a whole-time salaried service for giving clinical attendance to sick persons. We do not propose to argue the general question at the present time, but it will be obvious to any one who seriously considers the matter that the prevention of disease and the treatment of disease in the individual are two different departments of medicine, in which different methods must necessarily be employed. The discovery of the cause of a disease has, with, so far as we know, only one notable exception, always preceded the institution of effective measures for its prevention. We may take as an instance a point raised this week in the *Times*. It is made a reproach to the profession that it has not discovered the origin and nature of scarlet fever and measles, and we are asked to contrast this with the success that has attended research, and administrative measures founded upon it, in controlling certain tropical diseases. It is true that the many attempts to discover the nature of the virus of scarlet fever and measles have not been successful, but they have been carried on and repeated in all civilized countries for something like a generation, and enough has been ascertained to make it almost certain that they belong to a class of infections not comparable with those producing such tropical or subtropical diseases as, for instance, malaria and trypanosomiasis, and it is misleading to write as though they were. In spite of the existence of state medical services in many tropical countries, little progress was made in the business of getting rid of tropical diseases by any government until the nature of the infections was discovered. When this had been done, and it proved a simpler matter than had been expected, administrative measures for prevention became relatively easy to apply. The problems of preventing measles and scarlet fever have engaged the attention of medical officers of health for a generation, but, lacking knowledge of the true nature of the infection, the

solutions proposed have been only partially successful; in fact, it may be doubted whether they have been attended with any real success at all, and the history of medicine goes to prove that it will not be possible to devise effective methods of prevention until the infective agent of each disease has been discovered and its characters carefully studied. This work must be done in laboratories, and the maintenance of such laboratories and the encouragement of workers in them are proper functions of the state acting either directly or through the universities and colleges. A healthy man desires to be protected from disease, but the sick man calls for relief of his sufferings, and that relief must be brought to him at his bedside by a practitioner in whom he has confidence. It is arguable that he could obtain what he wants under a state medical service, and we should be very glad to see the point discussed both in medical journals and in the public press; but it should be debated in a large spirit, with full appreciation of both sides of the problem. Due weight should be given to the feelings of the individual patient as well as to the safety of the community, and due regard should be paid to the history of the progress of medicine, and to the methods by which it has been achieved.

AN INTRODUCTORY ADDRESS BY ERASMUS.

In a volume of selected essays on medicine by old Dutch writers published in commemoration of the fiftieth anniversary of the appearance of the first number of the *Nederlandsch Tijdschrift voor Geneeskunde*,[1] there is one by Erasmus entitled "Encomium artis medicae," which reads amusingly like the introductory address that used to be the chief feature in the ceremony at the opening of our medical schools. Erasmus was not a physician, but, like nearly all the scholars of his day, he took a keen interest in medicine. His discourse may have been a mere academic prolusion, but internal evidence seems to show that it was an address actually given to students, as he speaks of "the salutary custom of our forefathers to excite, kindle, and inflame the minds of our young men to the study, admiration, and love of this most glorious science by a yearly encomium." Whether it was delivered by Erasmus is another matter. He speaks in one place of "our art," and we know that he wrote on all sorts of subjects for a living, and it is quite likely that in his younger days he played the part of "ghost" to some professor of medicine. In the dedication to Dr. Henry Afinius, "the excellent physician of Lier" (a town in Brabant), dated Louvain, March 13th, 1518, he says that in looking through his library recently he had come across an oration declaimed by him long before "when he was still inexperienced," but there is nothing to indicate the place or date of its delivery. His praise of medicine is so highly pitched as to breed a suspicion that the author of the *Encomium Moriae* was indulging his gift of irony at the expense of the doctors. But we think he was essentially sincere, for the rhetoric of his eulogy is tempered by strong denunciation of false brethren in the profession. Erasmus had a clear perception of the intimate relations between body and mind. Mental defects, he says, influence the body, while bodily disease in its turn hinders and even destroys the activity of the mind. Therefore the physician insists on abstinence, sobriety, moderation in sexual intercourse, and the avoidance of anger and melancholy. The divine, he says, persuades men to turn from their sin, but the doctor makes them physically capable of doing this. Like even the most enlightened men of his day, Erasmus believed in astrology, and he dwells on the special difficulty of observing the heavenly bodies "which the doctor is bound to know lest the remedy he administers should really be a poison." But on other subjects his views are by no means obsolete even at the present day. Thus he declares it to be perhaps the first duty of rulers to safeguard the health of the community. "What does it profit to drive the enemy from the walls when pestilence stalking within destroys more lives than the sword?" The ancients in their laws, he goes on to say, before greed and ambition had corrupted public life, made it their first consideration to keep the bodies of their citizens healthy, strong, and well proportioned. These things depend partly on the natural constitution, partly on education, exercises and diet, somewhat also on the construction of buildings. It belonged to the office of the physician to see that only persons of good constitution were allowed to marry, and that healthy nurses should be employed; he instituted public baths and gymnasiums; he promoted legislation against luxury; he warded off epidemics by rebuilding houses and draining marshes and was watchful in preventing the sale of food and drink injurious to health. But in our days rulers think it no concern of theirs if poisons are sold for wine or if by bad grain or rotten fish diseases are spread among the people. "There is no part of life," says Erasmus, "that can be properly regulated without the aid of medicine." He concludes with the usual flourish calling on the "excellent youths" whom he addresses to throw all their energies into the study of a science that will gain for them "honour, glory, influence, and wealth; and by which they will be a blessing to their friends, their country and the whole human race."

[1] *Opuscula Selecta Neerlandicorum de arte medica*. Amstelodami, apud F. van Rossen. MCMVII.

KITCHENER MEDICAL SCHOOL, KHARTOUM.

We have received from Lord Cromer, President of the Gordon Memorial College, Khartoum, a letter commending the appeal made by Sir Reginald Wingate, Governor-General of the Sudan, for a fund to found a permanent memorial to the late Lord Kitchener in Khartoum. It has been decided that the memorial should take the form of a school of medicine to be affiliated to the Wellcome Tropical Research Laboratories; it would thus become a part of the Gordon Memorial College. Students who have passed through the institution will be fitted to serve as officers in the Egyptian Army Medical Corps, as officials in the medical department, and as general practitioners in that country. The proposal to establish a school of medicine at Khartoum was a project Lord Kitchener desired to see carried out. It was frequently advocated by him in conversation. The appeal is for funds sufficient to provide a building appropriate to the requirements and worthy of the name it would commemorate. All moneys now collected would be spent upon the building and equipment. Subscriptions may be sent to Mr. Baldwin S. Harvey, Honorary Secretary, Gordon Memorial College, 67, Lombard Street, E.C. The College was established as the result of a personal appeal made by Lord Kitchener at the end of 1893. The fourteenth annual report issued recently deals with the work of the College during a period of eighteen months, from June, 1914, to the end of 1915. The Principal, Mr. John W. Crowfoot, M.A., states that in consequence of the war it has been necessary to reduce the work of the College in several directions. The College has a primary school and upper school, and instructional workshops, and opportunity has been taken to remodel the teaching arrangements in some respects. The new curriculum has been planned with the double object of conferring a good foundation for specialized engineering courses, and of giving a balanced training of hand and eye and mind such as will fit boys, with or without further specialization, for the occupations—clerical, administrative, and educational—open for them in the country. The work of the laboratories has been hampered by the loss of workers owing to the call of the war, or in some cases owing to illness, and by the increase of routine work, especially in the bacteriological section. The number of routine bacteriological examinations made increased from 1,387 in the twelve months

ending June 15th, 1914, to 4,424 in the eighteen months ending December, 1915. Of these, 3,643 were performed during the year 1915. Nevertheless, a good deal of research work has been carried out, and a number of papers have been published. The chief subjects investigated have been the intestinal infections found in the Sudan and epidemic cerebro-spinal meningitis. The study of this disease was begun in 1913, and was continued during the recent recrudescence. Dr. A. J. Chalmers, who is in charge of the Wellcome Tropical Research Laboratories, states that the vaccine-therapy started some two years ago has been improved and varied, and expresses the hope that a measure of success, both from the therapeutic and prophylactic standpoints, will attend the use of the latest form of the remedy. Owing to the illness of Mr. King, the director of the entomological department, Dr. Chalmers had to take over its direction also, and for this reason and owing to the want of workers, the number of investigations was necessarily curtailed; various bulletins and circulars have, however, been published in English and Arabic dealing with locusts, the dura asal fly, and an injurious weed, "hambok." In commenting on the report, Sir Reginald Wingate says that Dr. Chalmers has been unsparing and indefatigable in his efforts to carry on the valuable work of the research laboratories in the face of many difficulties which have made it necessary to confine research to urgent diseases and entomological problems of vital importance to the Sudan.

THE FUNCTION OF A HOSPITAL SHIP.

In the House of Commons on July 18th it was suggested, by a question put to the Parliamentary Secretary to the Admiralty, that after the battle of Jutland men suffering from severe injuries were sent down from the extreme north to naval bases in the south of England when this need not have been done. The reply was to the effect that it certainly need not have been done, because there was, in fact, local accommodation available, but that nevertheless it was better that it should be done because moving the patients rapidly on was a better plan from an administrative point of view, and for the patient had the advantage of bringing him back to the neighbourhood of his own home. In the *Journal of the Royal Naval Medical Service* for October, 1916, there is an article by Acting Staff Surgeon A. Vavasour Elder, R.N.V.R., which has a considerable bearing on the subject, since it deals with hospital ships and their functions. The general conclusion to be drawn from this article would seem to be that a fully-equipped hospital ship can, practically speaking, only be employed in a port or at some other place to which the ships which have been in action can come up and transfer their patients without risk either from the enemy or the elements. The article, in fact, seems to argue that a hospital ship in home waters should be regarded as the equivalent of an army casualty clearing station, but that it is not a good kind of casualty clearing station because its accommodation is strictly limited; nevertheless, there are indications in the article that it is as casualty clearing stations that the Admiralty wishes to use them. A reader, relying on this article and the answer given in the House of Commons, would probably gather the impression that a fully equipped hospital ship, as distinct from a carrier, is a superfluity in the North Sea, and that the naval, like the military, casualty clearing station should be on shore. It is, however, open to question whether the parallel drawn between these hospital ships and casualty clearing stations is as close as this. The casualty clearing stations in France, as also the base hospitals, may be flooded at any time by inrushes of patients, and the same may possibly be said of the hospital ships, but there the parallel seems to end. The military hospitals in France are not certain of being able to evacuate their patients at any moment that may be most convenient to them; their ability to do so depends upon the state of the channel. Bad weather in the channel or floating mines, or the presence of submarines, or a sudden dash down of the enemy's destroyers, may render it impossible to transfer invalids in any number from France to Great Britain for several days. It is well, therefore, that from France the patients should be transferred to England as soon as possible in order that there should never be any risk of the hospitals being choked. But the position in the north of England is different. To clear the hospital ships there at any moment is merely a question of bringing up trains. Besides this, even in the military hospitals in France, the patients are not automatically pushed on; they are kept as long as may be deemed desirable from the clinical point of view, provided nothing in the way of unusual activity on the front is in view. Consequently there seems to be, on the whole, a good deal of weight in the suggestion that, so far as their accommodation permits, patients should be kept in the hospital ships as long as possible. It is sometimes argued that it is better for the patients themselves from the surgical point of view that they sh uld be sent on forthwith to the hospital at which their treatment is to be completed—that is to say, as rapidly as possible after the time at which they are first injured. This view might be accepted if it could be shown that they could be got to the hospital where they are to be treated within twenty-four hours, but if a longer period must elapse the position is quite different. Apparently after the battle of Jutland the average period which elapsed after the action before the wounded could be transferred from the fighting ship was nearer thirty-six than twenty-four hours. There appears to be a suggestion also that even modern hospital ships are not really fitted to treat patients for any length of time, but this opinion does not appear to be well founded, for the hospital ships in use in the North Sea are, we believe, of the same type as those which brought patients home from the Eastern Mediterranean, and have every sort of provision for medical and surgical treatment of the very best type. To compare them with the hulk hospital ship of former ages is to give an altogether wrong impression.

FRENCH PRISONERS IN GERMANY.

Although the Germans have all along treated their British prisoners with special brutality, the French, whom they now profess to love, have had no very pleasant experience of their tender mercies. Proof of this has already been given in the Journal; more is now forthcoming in a report by M. Louis Rénault, of the Institute of France, a very distinguished international lawyer and a member of the Permanent Court of Arbitration at The Hague. The *Times* has published an abstract of this report by its Paris correspondent. After bringing forward a large mass of documentary evidence as to the humane treatment of German prisoners in France, M. Rénault describes the horrors of German camps. At Celle, Heuberg, Landshut, and Sennelager, crowds of sightseers go on Sundays to jeer at the prisoners. "The men are treated like things." At Altengrabow, on the very day of a visit from the Kaiser, a soldier of the 8th Chasseurs was bayonetted because he did not come out when ordered. At Ohrduf, near Berlin, one of the colonial troops was killed by a bayonet thrust in the heart for failing to understand an order. At the same camp, at Würzburg, and at Cassel Niederzwehren, on different occasions and on flimsy pretexts bayonet charges were made in which prisoners were killed and wounded. The punishments—tying to posts and so forth—have been referred to in previous articles in this Journal. M. Rénault says men have died at the stake for such offences as smoking in a hut or not saluting an officer properly. "There are plenty of other fiendish tortures, undreamt of by a Fennimore Cooper savage, such as placing a prisoner barelegged on a tarred roof in the blazing sunshine." Madame Karen Bramson, a Danish

writer, who was quoted in the JOURNAL of November 4th (p. 628) as to the condition of the camp at Gastrow, gives a general description of the German camps. They are divided into three classes: (1) The official "model" camps, which are arranged for inspection by neutrals. (2) The "reprisal camps," where the "severe" treatment of French prisoners has been admitted by the German Government to be intended as a menace to France because of her alleged ill treatment of German prisoners. As it has been conclusively proved that the treatment of prisoners in France is in full accordance with all the requirements of the Berne and Hague Conventions, the German Government can no longer justify the existence of such camps, and has consequently abolished them for the present. (3) The labour camps, where prisoners are used as a source of revenue and live in conditions "so horrible that they should be made known throughout the civilized world as soon as possible." Madame Karen Bramson was authorized by the French Minister for Foreign Affairs to make an inquiry into the prevalence of tuberculosis among French prisoners interned in Switzerland. As the result she charges the Germans with deliberately attempting to undermine the health of the captives by forced labour, so that after the war they will return home hopeless invalids doomed to death by consumption. Well may she say that Germany can never by any sophistry clear herself in the eyes of the world of the guilt of disgraceful ill treatment of her prisoners. Yet in the face of all the damning proof of her brutality, the *Frankfurter Zeitung* dares to speak of "the deep-rooted humanity of our people, which regards the prisoner as no longer an enemy but only as a human being." It goes on to say: "The true chivalry according to which we act, without talking much about it, constrains us to make tolerable the lot of the enemy overcome in honourable battle." Surely even Teutonic impudence could no further go. The world knows by this time all about the "deep-rooted humanity" and the "true chivalry" of the German people, and understands why they do not talk much about it.

VENEREAL DISEASE IN CHRISTIANIA.

CHRISTIANIA is a town with just over a quarter of a million inhabitants. According to its health inspector, Dr. Y. Ustvedt,[1] during the year 1915 its medical practitioners and infirmaries notified 2,424 new cases of venereal disease, of which gonorrhoea accounted for 1,549, acquired syphilis 585, soft chancre 243, and congenital syphilis 47. It is noted that in 20 of the new syphilitic patients the primary sore was extragenital—on the lips in 9 instances, the tonsils in 6, the mouth, finger, and arm in 1 each, and in 2 cases the precise situation was not indicated. In 75 instances the notification enabled inquiries into the source of infection to be made, in 58 with success. In at least 61 of the 2,424 cases the infection was contracted outside Christiania; most of the 61 were seamen. During the year the officials of the Health Commission examined 600 persons presenting themselves to see if they required treatment for venereal disease; such treatment was ordered in 102 cases. The Health Commission commands the services of a woman doctor; in 1915 she had 54 women, 34 of them with syphilis, and 3 children to treat. Wassermann's serum test was applied in 361 instances; and 6 new cases of syphilis occurred in patients who had already had salvarsan treatment. For knowingly exposing others to venereal infection 19 women were prosecuted by the police, and 7 of them were convicted and punished; the law punishes this offence with imprisonment for a term not exceeding three years. The "Odd Fellows' Lodge" home for children with congenital syphilis, containing 20 beds, was kept full all the year. It appears that wives were infected with venereal disease by their husbands in 17 cases, and husbands by their wives in 9. Dr. Ustvedt gives a table showing the number of the new cases of venereal disease reported during each month of the year 1915. It appears that about 140 cases were notified during each of the first eleven months of the year, but in December the figure rose to 853; no reason for this sudden increase is suggested. Another table sets out the number of the cases of venereal disease reported in each year since 1876. In 1876 the population of Christiania was 97,000, and 1,012 cases were notified, or 1.28 per cent. of the inhabitants; in 1880 the population was 119,000, and the new cases of venereal disease numbered 2,258, or 1.89 per cent. of the population. During the last ten years the annual notifications have averaged 0.84 per cent. of the population of the town, and in 1915 the percentage was 0.96. The Christiania Town Council has allowed certain cases of venereal disease to be treated as ambulant patients free of charge since the year 1899; in 1915 this cost them about £150.

[1] *Tidsskrift for den Norske Lægeforening*, Christiania, 1916, xxxvi, 833.

THE INCOMPLETE CURE OF THE CONSUMPTIVE.

WITH every succeeding year the need for more rational and radical treatment of the consumptive becomes increasingly manifest. Evidence is forthcoming from institutions all over the country to prove that much more requires to be done if real success is to be achieved. To no one is this fact more obvious than to the superintendents of the larger sanatoriums, and a thoughtful commentary on the whole problem has recently been set forth, says the *Glasgow Herald*, by Dr. James W. Allan, of the City of Glasgow Sanatorium at Bellefield, in the county of Lanark. Emphasizing the fact that years rather than months are needed to induce complete healing of the tuberculous lung, even in its early stage, he puts forward suggestions for dealing with family and individual consumption as occurring at various ages of life and in varying social conditions. In effect the remedy that he advocates is wholesale migration from unhealthy surroundings to properly supervised dwellings in pure air. Parents with incipient disease, but capable of work, should be accommodated apart from their children, but under the same roof, and the dangers of possible infection should be neutralized by skilled control. Single men and women should have sleeping accommodation provided for them in huts, châlets, or cottages on the outskirts of the cities in which they have to work. Children should be treated in specially constructed sanatoriums, furnished with all necessary fittings for school and for recreation but within reach of their parents' homes. The scheme is somewhat utopian at the present time, but no one can have failed to note the marvellously invigorating effect of open-air and hut life upon millions of young men during the last two years. Not less noticeable has been the mental stimulus afforded by the centres for recreation and rest provided by the Y.M.C.A. Every one must realize that a similar course of life, scientifically regulated, for our great army of incipient consumptives might result in the course of a few years in permanent recovery instead of temporary improvement, as at present, and be the means of adding a notable increase to the man-power of the country.

LOAN FUND COMMITTEE.

THE first meeting of the new Committee appointed to consider the formation of a fund to assist by loans those medical practitioners who suffer financial loss owing to taking service with the navy and army, was held on November 15th, at 429, Strand. In response to invitations to take part in the work, temporary representatives were present from the Royal College of Physicians, London, and from the Royal College of Surgeons of England, and representatives from the Royal College of Surgeons of Edinburgh, from Epsom College, and the Royal Medical Benevolent Fund. Two memoranda were submitted for consideration: one on the general aspects of the proposal with an account of investigations thereon, and one on

financial methods. The evidence for the need of such a loan fund was closely debated, and a subcommittee was appointed to investigate the best means of initiating and administering such a fund, so that the liability of each contributor should be limited, and to report speedily on the whole question to the full Committee.

OFFICERS' BENEVOLENT BRANCH, AUXILIARY R.A.M.C. FUNDS.

A PARAGRAPH in an article published in the JOURNAL of last week (p. 694) was so worded as to give the impression that the Officers' Branch of the Auxiliary R.A.M.C. Funds was intended to help officers R.A.M.C. who returned disabled by wounds or sickness. As was stated in Dr. Collier's letter, to which the article refers, and in the appeal printed in the JOURNAL of September 23rd, p. 426, the primary object of the Officers' Benevolent Branch is to assist in the education and starting in life of those orphans of officers who have served during the present war in the Special Reserve, the Territorial Force, or the New Armies, who stand in need of such help owing to their fathers having died without having made sufficient provision for their families.

MILITARY MEDICAL ARCHIVES.

WE are indebted to several members for being so good as to send copies of the issue of the JOURNAL of February 13th, 1915, which is out of print, for transmission to the War Library of the French Army Medical School at Val de Grâce. We have no doubt that Professor Jacob, the Director of the Medical Archives, will desire us to express his thanks to the donors; the set thus completed will shortly be dispatched to him.

COUNT IGNATIEFF, Minister of Public Instruction in Russia, has forwarded to M. B. Sturmer, President of the Council, a memorandum from the Russian universities setting forth their views as to the means of developing the intellectual relations between Russia and her allies. It is suggested that a general congress of the teachers of Great Britain, France, and Russia should be held at Petrograd. The objects aimed at are the development of the teaching of English in Russian institutions for higher education; the sending of young Russian scholars and scientists to British and French universities; the creation of a post of "intellectual attaché" at the Russian Embassies in London and Paris; the organization of educational tours in Russia and Great Britain; and the establishment of a Russian Institute in Great Britain and of a British Institute in Russia.

THE National Herb-Growing Association has been somewhat embarrassed by its own success. It seeks to restore in Great Britain and Ireland the herb industry, and its founders realized at the outset that it must be placed on a sound commercial basis. The response was so good that with the available staff it had difficulty in replying to all inquiries from members. It has now established two sections at head quarters (20, 21 6/, Queen Anne's Chambers, Westminster), a co-operative division to carry on training, and an educational division to advise, organize, publish, and distribute literature, and arrange lectures and demonstrations. It has a number of affiliated local centres and five local offices, where the work is done partly by paid workers and partly by volunteers. In the preparation of herbs for the market there are two main processes, the collection and drying. Unfortunately a drying shed opened at Byfleet in the spring was burnt out and a good deal of prepared material destroyed. Nevertheless, one hundred tons of drug plants have been marketed. It is proposed to form new centres and to erect drying sheds, of which it is hoped there will be in time one easily accessible for all centres. New shareholders for the co-operative or trading section, and new subscribing members for the educational division are sought.

Medical Notes in Parliament.

Venereal Diseases in the Army.

MR. HOUSTON, on November 16th, asked the Secretary of State for War (1) whether he would state the number of men suffering from enthetic (venereal) diseases in the British army at home and abroad, as shown by the latest return, and the date of that return; and (2) whether he could state the number of men reported temporarily unfit for duty or service in the British army at home and abroad by reason of enthetic (venereal) diseases, as shown in the latest return, and the date thereof. The Financial Secretary to the War Office (Mr. Forster) said: "The admissions to hospitals at home from the cause in question represent a ratio of 48 cases per 1,000 men per annum, which is slightly less than the ratio in peace time. No figures are available for the troops abroad."*

Mr. Houston asked the Secretary of State for War (1) whether he could state the number of men permanently invalided and discharged out of the army owing to enthetic (venereal) diseases, but temporarily cured of the same, during the years 1914, 1915, and 1916, up to the latest return, and the date thereof; and (2) whether he could state the number of men suffering from enthetic (venereal) diseases who had been discharged uncured from the army at home and abroad during the years 1914, 1915, and 1916, and permitted to return to their homes. Mr. Forster said that no statistics were available, and to compile them would place additional work on a heavily-strained department. No men were discharged from the army for these diseases in the infectious stage.

War.

T.N.T. Poisoning.—In reply to Lord Henry Cavendish-Bentinck, the Under Secretary of State for the Home Department stated that the number of deaths for the six months ending October 31st was forty-one. It was impossible to say how many of them were caused by inhalation of fumes, but there was no reason to think that absorption through the skin was the chief danger; there might be absorption by both channels in the same case. In reply to a question about a specific case, the Parliamentary Secretary to the Ministry of Munitions said that a short time since the Ministry, after consultation with the Home Department, had appointed a committee, consisting mainly of experts, to examine the problems arising out of T.N.T. poisoning both from the mechanical and medical points of view, and the recommendations so far made by the committee had been adopted by the Ministry and were being put into effect. Many of the problems were entirely new, and in some cases difficult of scientific investigation.

Export of Morphine and Cocaine.—In reply to a question by Mr. Theodore Taylor on November 16th, the President of the Board of Trade said that the amount of British-made morphine and morphine salts exported in 1915 was 295,572 oz. Of this 281,112 oz. was exported to foreign countries, the greater part—204,742 oz.—to Japan. The amount of British-made cocaine and cocaine salts exported in 1915 was 17,647 oz., a greater amount than in any year since 1911, the year in which such exports were first separately recorded. Lord R. Cecil informed Mr. Taylor that morphine was smuggled into Manchuria and China from Japan.

British Prisoners in Turkey.—In reply to Sir E. Carson, Mr. Hogge stated, on November 14th, that the number of British prisoners in Turkish hands, including Indian prisoners, was believed to be about 12,530. The Turkish Government had not supplied any list in spite of numerous requests, and had refused permission to members of the American Embassy to visit the prisoners' camps. He feared that the conditions were extremely bad, but the American authorities were doing their best under very difficult circumstances. It would be idle to deny that the present situation was unsatisfactory in the extreme.

Asylums as Military Hospitals.—In reply to Mr. Rendall, on November 21st, the Home Secretary said that the Board of Control had been able to render valuable assistance to the military authorities in providing accommodation for wounded soldiers. Thirteen asylums, and a part of a fourteenth, containing over 15,000 lunatic patients, who were transferred to other asylums, had been adapted for hospital purposes and equipped with modern surgical and medical appliances. About 23,600 beds were thus provided, and up to the present date they had been used for over 100,000 sick and wounded soldiers.

(See also page 728.)

*According to the statistics published by the Royal Commission on Venereal Diseases, admissions per 1,000 of army strength from all venereal diseases, which had stood at 224.5 in 1888, had fallen to 56.5 in 1912. The rate had fallen to 93 in 1900 when a large part of the regular army was in South Africa; this was followed by a rise to 131 in 1903, by which time most of the regular and newly raised troops had returned to this country. There was then a rapid decline to a rate of 82 in 1906 and afterwards a slower fall to the rate of 1912.

THE WAR.

CANADIAN ARMY MEDICAL SERVICE.

Board of Inquiry.

THE following official announcement is issued from the office of the High Commissioner for Canada:

For the purpose of obtaining an authoritative finding upon the issue which has arisen out of the recent report on the Canadian Army Medical Service by Colonel Herbert A. Bruce, and the reply thereto by Surgeon-General G. C. Jones, Sir George Perley has constituted a Board of Inquiry, with instructions to report as quickly as possible upon the criticisms made in Colonel Bruce's report, and whether they are justified in whole or in part; also upon the recommendations made by Colonel Bruce, and whether the Board endorses and concurs in them; and, if not, in what respect does the Board differ in opinion, and its reasons therefor. The personnel of the Board is as follows: President, Surgeon-General Sir William Babtie, K.C.M.G., C.B., V.C., nominated at the request of Sir George Perley by Sir Alfred Keogh, Director-General, British Army Medical Corps. Members: Colonel E. C. Ashton, C.V.O., C.T.D., Shorncliffe; Colonel J. T. Fotheringham, C.M.G., A.D.M.S., 2nd Canadian Division, B.E.F.; Colonel A. E. Ross, C.M.G., A.D.M.S., 1st Canadian Division, B.E.F.; and Lieutenant-Colonel J. M. Elder, No. 3 Canadian Hospital, Boulogne.

The announcement may, perhaps, require some explanation beyond that given in the JOURNAL of last week (p. 697). The first Canadian contingent arrived in this country rather over two years ago, and the Director of the Medical Service of the Canadian Expeditionary Force in Europe was Surgeon-General G. Carleton Jones, C.M.G., who was promoted to that rank on September 22nd, 1914, after a long period of service in the Canadian Militia. The medical arrangements for the Canadian contingents were organized and have been carried out by Surgeon General Jones, who has had the assistance of a staff of officers of long experience in the Canadian Militia. The arrangements have involved provision for the medical service of the contingents in this country, in the army zone in France, and for men invalided to this country owing to sickness or wounds. As we said last week, the arrangements were well conceived; they have now been tested by war, and many adaptations and improvements have been made as experience under the special conditions in Flanders and France was gained. The excellence of the work done has been recognized in dispatches, and Colonel Foster, the Canadian D.D.M.S. in France, has received the C.B. The efficiency of the service has been steadily increasing, as was to be anticipated, since its direction and administration are in the hands of experienced officers, who keep open minds, ably seconded in all units by surgeons who are progressive—that is, ready to test every new method and to learn by experience.

Perfection had not been reached, but it was being striven for, and effective means taken to remedy any defects disclosed under the strain of war in a force very greatly larger than Canada has ever put into the field before, when last summer Sir Samuel Hughes, then Minister of Militia in the Canadian Ministry, appointed a commission, of which Dr. Herbert A. Bruce of Toronto was nominated president with the rank of Colonel. We are informed that extracts from the report by him referred to in the official announcement quoted above were published in the Canadian newspapers at the end of October. The report has not been published in this country, nor has the report in reply made by Surgeon-General Carleton Jones. The general tenor of the report of Colonel Bruce's commission is, however, known to Canadian medical officers, both in this country and in France, and has caused much indignation and dissatisfaction. One result of the report was that Surgeon-General Carleton Jones was, as we understand, superseded in the office of D.M.S., and another was that Sir William Osler resigned his position as consultant to Canadian hospitals, and sent the following telegram to Canadian newspapers:

My resignation as consultant at Canadian hospitals was a protest against the injustice done to the Director in the mode of appointment of the hospital commission. The profession and the public should suspend judgement until General Jones's full report has been printed and given to the press. I have not as stated resigned from the Canadian Hospital, Beechboro Park, which is under Imperial authority. During the past two years I have had many opportunities to see Canadian wounded in British hospitals, in which I have everywhere found them well treated.

We hope that the commission now appointed will prosecute its inquiry with all diligence, for the present state of affairs cannot but have an unfavourable effect upon the efficiency of the Canadian Army Medical Corps, which has done such admirable work both for men of the Canadian contingent and for the whole British Army. We fully believe that the tenor of its report will be such as to lead to the reinstatement of Surgeon-General Carleton Jones and to justify Sir William Osler in withdrawing his resignation.

We have received, under date November 10th, the following note from our correspondent in Montreal, which appears to show that it is understood in Canada that the services of Surgeon-General Jones are to be retained:

The announcement of the appointment of Sir George Perley as Canadian Minister of War Overseas, and the news that Surgeon-General Guy Carleton Jones, C.M.G., is to remain in England as Director of the Canadian Medical Services have been received with satisfaction by the profession in Canada. The publication in the lay press of extracts from a confidential report on the Canadian Army Medical Corps, prepared by Colonel H. A. Bruce, C.A.M.C., under the direction of the Minister of Militia, is deplored, as it is felt that this has subjected a branch of the Canadian Expeditionary Force, which has proved itself efficient and done excellent service, to general criticism which is unmerited. It is true, as the report states, that a number of soldiers have been recruited in Canada who upon arrival in England were found to be unfit for active service and had to be sent back to Canada, and that the Canadian Government was thereby put to unnecessary expense, but it is true also that in the medical examination of potential recruits the military exigencies of the situation have sometimes been considered of more importance than the opinion of the examiner, and the keen competition between rival battalions has frequently led to the acceptance of a man who in the opinion of the examining medical officer should have been rejected.

TIBIAL OSTEITIS IN SOLDIERS.

UNDER the headings "Gaiter pain," "Periostitis of the tibia," etc., the Germans and Austrians have published a number of cases the etiology of which is regarded as still obscure. At a meeting of the Aerztliche Verein in Hamburg, Querner[1] reported three cases observed in the autumn of 1915 on the Eastern front. One patient was an officer, and two were Landsturm privates. They complained of most violent pain in the shins, could not walk, and sleep was much broken. The skin was somewhat rough over the tibiae, which were tender. In every case there was a moderate degree of dilatation of the veins, and there were small palpable phlebitic areas over the tibiae. In two cases the temperature was normal; in the third it rose to 38.2° C. on the third day after admission to hospital.

In every case the *x* rays confirmed the diagnosis of periostitis. There was no history of trauma or overexertion; Wassermann's reaction was negative; there was no sign of tuberculosis or gout; and serum reactions for dysentery and typhoid fever were negative. The officer had worn gaiters, but they had exerted no uncomfortable pressure. Of the privates, one had worn wide, high boots; the other, short lace boots. One of the patients had been cold and wet one night, had subsequently developed a feverish chill, shortly followed by tibial pain, which grew worse. Another patient had suffered from giddiness, palpitation, and lassitude previous to the onset of the pain, which was relatively sudden. The officer had suffered from high fever and violent pain in all the joints and bones shortly before admission to hospital. After a few days all that was left of this attack was the violent pain in the shins. There was therefore in every case a definite history of a chill, and the condition might well be regarded as rheumatic. Another possibility was that the symptoms were related to the phlebitis invariably present. In every case the disease was rather refractory to treatment with aspirin, electrical baths, and packs. The officer was better after two to three weeks, but the privates, three months later, still suffered from the pain after exertion. Tenderness and *x*-ray signs of periostitis were still demonstrable.

[1] *Deut. med. Woch.*, June 22nd, 1916.

Professors Kraus and Citron[2] have described a special form of osteitis frequently observed among soldiers. It had been mistaken for a great variety of diseases, including even tuberculosis. The bone most often affected was the tibia. The onset of the symptoms was sudden, and they were almost invariably accompanied by slight and usually transitory fever. Sometimes a second rise of temperature occurred after an afebrile interval of several days. The pain was severe even when the limb was at rest and even light pressure was often unbearable. The condition was usually symmetrical, but might begin earlier, and be more severe on one side than on the other. The nerve trunks in the area affected showed no special tenderness, either general or local. Sensory disturbances and atrophy of the muscles, even at a late stage, were never seen, and the joints were practically never involved. There was little muscular tenderness, but great tenderness of the bones. The pain resembled that of syphilitic osteitis, and morphine was frequently required to relieve it. Diffuse swelling of the lower half of the leg below the knee, persisting for some time or disappearing early, was common, but the skin was never reddened. Frequently the affected limb felt abnormally warm, and occasionally severe local perspiration was observed. This condition did not arise only in the trenches, nor could it be associated with any special foot-wear. No connexion with typhoid fever, tonsillitis, or disturbances of nutrition could be established. The febrile onset and the signs of inflammation suggested an infectious condition. A marked increase in the number of the mononuclear cells was found in seven out of eight cases in which the blood was examined. Salicylates relieved the pain, but were not as effective as in articular rheumatism.

[2] *Deut. med. Woch.*, July 13th, 1916.

CASUALTIES IN THE MEDICAL SERVICES.

ROYAL NAVY.

Killed in Action.

SURGEON C. H. GOW, R.N.

Temporary Surgeon Charles Humphry Gow, R.N., killed in action on November 13th, aged 25, was the only son of the Rev. Henry Gow of Hampstead. He was educated at Westminster School and Emmanuel College, Cambridge, and subsequently at St. Bartholomew's Hospital. On the outbreak of war he volunteered as a surgeon probationer. After serving eight months in the destroyer *Laforey* he returned to the hospital, and took the diplomas of M.R.C.S., L.R.C.P.Lond. in 1915. He received his commission as temporary surgeon on July 19th, 1915, and served with the Royal Naval Division in Gallipoli and Salonica, and for the last eight months at another front.

ARMY.

Killed in Action.

CAPTAIN H. BEGG, R.A.M.C.

Captain Henry Begg, M.B., R.A.M.C., who has been killed in action, was the fourth son of Mr. George Begg, of Mains of Druminnor, Rhynie. He received his medical education at the University of Aberdeen, where he graduated M.B., Ch.B. in 1906. He had held the posts of clinical assistant to the Great Northern Central Hospital and the Mount Vernon Chest Hospital. Prior to the war he was in practice in Kentish Town, London.

CAPTAIN J. D. FORRESTER, R.A.M.C.

Captain James D. Forrester, killed in action, was educated at the Peebles Burgh and County High School and George Watson's College, Edinburgh. He graduated M.B., Ch.B.Edin. in 1912. He received a commission as temporary lieutenant in the R.A.M.C. on February 1st, 1915, and was promoted to captain a year later. Prior to receiving his commission he was in practice at Peebles, and had served as senior house-surgeon to the Rochdale Infirmary and house-surgeon to the Royal Halifax Infirmary. He married last year and leaves a widow and daughter.

CAPTAIN T. L. INGRAM, D.S.O., M.C., R.A.M.C.

In the JOURNAL of October 21st, in announcing that Captain Thomas Lewis Ingram, D.S.O., M.C., R.A.M.C., had been killed in action we gave a short account of his career. We have now received from a colleague, "M.D., R.A.M.C.," the following tribute to his memory:

Of the unusually high degree of attachment that existed between himself and his friends this is not the place to speak, but, to show the honour in which he was held by all who knew him, I will quote a few extracts from letters written by those with whom two years of war had thrown him in contact.

The Brigadier-General writes:

No more gallant soldier or braver gentleman ever lived . . . and his dauntless courage and unfailing cheeriness was worth many men, and the men of his regiment simply worshipped him.

His Colonel writes:

He was the bravest man I have met, and one meets many here. He was beloved by every man in the regiment, and was known and respected by every unit in the division.

A fellow-officer writes:

I shall look on him as the finest, kindest, most lovable man I ever knew. To say anything about his bravery is superfluous, for he earned some decoration every time he went into the trenches, but it is as the kindest and most unselfish of friends that I shall remember him. I am sure that of the many officers we have had each one will consider that the bravest and the one he liked best was the "doc."

Captain Ingram met his end rescuing wounded from the German barbed wire. The bearers he had sent back, as the work was too dangerous for them, but he and another man continued alone.

One may sometimes possibly be tempted to exaggerate the virtues of the heroic dead, but in the testimonies above recorded only the barest truth has been stated, and even then one can add, "The half has not been told."

LIEUTENANT W. C. E. BOWER, R.A.M.C.

We have received from Dr. E. A. Chartres, Deputy P.M.O. in Nigeria of the West African Medical Staff, the following note about the late Lieutenant W. C. E. Bower, R.A.M.C., whose death in action, on October 20th, was reported in the BRITISH MEDICAL JOURNAL of November 11th:

I would like to mention the following incident, which occurred in the North Cameroons when I was Senior Medical Officer in charge of the allied forces.

Lieutenant Bower was reported to me for gallant conduct during the attack on Banyo mountain. Captain Seccombe officially wrote to me that he (Lieutenant Bower) had come up the steep side of the mountain in broad daylight without any cover, in the face of heavy rifle and Maxim fire, to attend him when dangerously wounded. Captain Seccombe felt sure that his life had been saved by the prompt action of Lieutenant Bower. Now that he has fallen in action in France—no doubt due to his unselfish devotion to duty—I feel that this incident may be made known through the medium of your JOURNAL.

I personally regret his loss to our service. He had always shown himself a hard worker and a plucky and loyal colleague.

LIEUTENANT J. R. BROWN, R.A.M.C.

Lieutenant John Ritchie Brown, R.A.M.C., died of wounds on November 7th. He was the third son of the late Dr. J. Brown, of Saltcoats, Ayrshire, was born in Saltcoats in 1873, and was educated at Ardrossan Academy, at Stanley House School, Bridge of Allan, and at Glasgow University, where he graduated M.B. and C.M. in 1897. After acting as house-surgeon at Teignmouth Hospital, he served for about two years as a ship surgeon in the British India Line. When the South African war broke out he took an appointment as a civil surgeon to the forces, and served for eighteen months, till he was invalided. Returning to South Africa he became a district surgeon in Southern Rhodesia, under the British South Africa Company, where he was also medical officer of the Falcon Mines at Umvuna, till he returned to England, towards the end of 1915, and took a temporary commission in the R.A.M.C. Lieutenant Brown and his brother, Dr. W. Mackenzie Brown of Dalry, are the fourth generation in their family to enter the medical profession.

Died on Service.

LIEUTENANT-COLONEL C. S. RUNDLE, I.M.S.

Lieutenant-Colonel Cubitt Sindall Rundle, Madras Medical Service (ret.), died suddenly of heart disease in Jersey, on November 11th, aged 62. He was born on March 13th, 1854; educated at Edinburgh University, where he graduated M.B. and C.M. in 1877, and entered

the Indian Medical Service as surgeon on March 31st, 1880, becoming surgeon-major on March 31st, 1892, and lieutenant-colonel on March 31st, 1900. He retired on May 5th, 1907. The *Army List* assigns him no war service. After retiring from India he settled in Jersey. He was for some time honorary secretary of the Jersey Choral Society, and was himself a musician of considerable ability. At the beginning of the war he volunteered for service, and, when a camp for prisoners of war was opened in Jersey, he was appointed to its medical charge. He leaves a widow, a son, and a daughter. Another son was killed in Gallipoli last year. He was buried with military honours on November 15th, and among the many floral tributes laid upon the coffin was a beautiful wreath sent by the German prisoners of war.

MAJOR C. H. BENHAM, R.A.M.C.(T.F.).

Major Charles Henry Benham, R.A.M.C.(T.F.), was reported as having died on service in the casualty list published on November 18th. He was born at Ipswich in 1874, the son of Dr. Henry James Benham, was educated at Queen Elizabeth's School, Ipswich, and at University College Hospital, and took the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1897 and that of M.R.C.P. in 1906. He graduated M.B.Lond. in 1897 and M.D. in 1899. After acting as house-physician at University College Hospital, resident medical officer of Brixton Dispensary, and medical clinical assistant at Sussex County Hospital, he went into practice at Hove. He was chairman of the East Sussex Medical Committee. He joined the 2nd Eastern General Hospital, Brighton, as a captain in the R.A.M.C.(T.F.) on April 27th, 1908, and was promoted to major in April, 1916.

Dr. L. A. Parry (Hove) sends the following appreciation of his colleague at the 2nd Eastern General Hospital, whose untimely death on active service is deeply regretted by all who knew him: Of his professional and scientific abilities I will say little. His career at University College Hospital was brilliant. His leanings were chiefly in the direction of pathology and bacteriology, and his services were often utilized at the Royal Sussex County Hospital, Brighton. He took a keen interest in municipal affairs, and was a member of the Hove Town Council and of several of its important committees, notably of the Education Committee. I well remember the time of his first election to that body, into the contest for which he threw himself with all the energy and intensity of his nature, being returned at the head of the poll. He was also a prominent Mason and chairman of the St. Elizabeth Guild of Education in the town. His work in connexion with the British Medical Association, in which he held many appointments, including quite recently those of Chairman of the Brighton Division, and Secretary of the Section of Bacteriology and Pathology at the annual meeting at Brighton in 1913, was greatly appreciated by his fellow practitioners. He was recognized as one of the best secretaries of Divisions in the country. His action during the Insurance Act controversy gave rise to a certain amount of criticism amongst some of the members, but it was only those who did not take the trouble to understand all the facts who misjudged him. Just over a year ago he, although over military age and a member of the staff of the 2nd Eastern General Hospital, volunteered for foreign service. He was sent to Salonica, and his work there was greatly appreciated by those best able to judge. He contracted dysentery, and was sent back to Malta, where, after undergoing an operation for hepatic abscess, lung complications ensued, from which he died. He leaves a widow and four young children. He is the first member of the staff of the hospital to make the great sacrifice. His deep sense of duty and patriotism led him to offer himself for service abroad, and his death in the cause of his country is deeply regretted by his colleagues, his friends, and his patients.

CAPTAIN V. J. RUTTLEDGE, R.A.M.C.

Captain Victor John Ruttledge, who is reported to have died on service, was educated at Trinity College, Dublin, and took the degrees of M.B., B.Ch., and B.A.O.Dublin in 1891. He subsequently held the office of assistant medical officer to the District Asylum, Londonderry. He received his commission as temporary lieutenant R.A.M.C. in May, 1915, being promoted to captain a year later.

Captain A. Groenwald, M.C., South African Medical Corps.

Wounded.

Captain H. St. A. Agate, R.A.M.C. (temporary).
Captain H. J. Bower, R.A.M.C. (temporary).
Captain J. T. Heffernan, R.A.M.C. (temporary).
Captain J. Sainsbury, R.A.M.C. (temporary).
Captain H. E. P. Yorke, R.A.M.C., attached East Yorks Regiment.
Lieutenant G. Arthur, R.A.M.C., attached Bedford Regiment.
Lieutenant G. C. Linden, R.A.M.C. (temporary).

Captain Agate had previously been reported as wounded a little more than a month ago (BRITISH MEDICAL JOURNAL, October 16th).

Prisoners of War.

A list was published on November 15th of prisoners of war taken at Kut in April, and exchanged by the Turks. It includes a few combatant officers, probably sick or wounded, and six officers of the R.A.M.C.: Lieutenant-Colonels H. O. Browne-Mason and J. Hennessy, C.B.; Major E. V. Aylen; and Captains A. S. Case, W. L. E. Fretz, and A. T. J. McCreery.

Captain H. Kay, South African Medical Corps, a prisoner of war, has been released by the Germans.

DEATHS AMONG SONS OF MEDICAL MEN.

Aitchison, Andrew Leslie, Second Lieutenant King's Own Scottish Borderers, son of Dr. H. H. Aitchison, of Wallsend, died of wounds. He was educated at Eskdale College, Newcastle, at Shrewsbury, and at King's College, Cambridge.

Buchanan, H. C. Dudley, Lieutenant Middlesex Regiment, son of Dr. Buchanan, of Arva, co. Cavan, died of wounds. He enlisted at the beginning of the war, got a commission in September, 1915, and was promoted to lieutenant last February.

Caiger, Frederick Howard Stewart, Second Lieutenant Royal Field Artillery, only son of Dr. F. Foord Caiger, killed November 11th, aged 19. He was educated at Doon House, Westgate-on-Sea, and Winchester College. He entered St. Thomas's Hospital for the preliminary science course in January, 1915, and in October of the same year went up to Caius College, Cambridge. Immediately after passing the first M.B. examination in December, he relinquished his medical studies and was gazetted second lieutenant in the Special Reserve of Officers on December 8th, 1915, and after four months' artillery training he went to the front on Easter Sunday last. The colonel of his brigade writes: "He was a most excellent officer, popular with us all, most gallant, lovable, and capable, and though not strong he never lost his good spirits, and was always a most charming companion."

Clarke, William Michell, Second Lieutenant Royal Engineers, younger son of Dr. J. Michell Clarke, of Clifton, Bristol, killed November 11th, aged 19.

Habershon, Leonard Osborne, Captain East Yorkshire Regiment, youngest son of the late Dr. S. H. Habershon, physician to the Hospital for Consumption, Brompton, was killed in action on November 13th, aged 23. His brother, Captain Kenneth Ross Habershon, of the Rifle Brigade, was killed on February 13th last.

Macdonald, Malcolm, Private, Argyll and Sutherland Highlanders, son of James Macdonald, M.D., of Carlisle, killed October 13th, aged 19. He was educated at Carlisle Grammar School, and had just entered Edinburgh University as a medical student when he enlisted. He had been recently recommended for a commission.

McKisack, L. H. W., Second Lieutenant Royal Flying Corps, eldest son of Dr. H. L. McKisack, of University Road, Belfast, killed recently, aged 19. He got a commission in the Special Reserve of the Royal Garrison Artillery on January 22nd, 1915, and had recently been transferred to the Royal Flying Corps.

Rennie, James C., Private, Scottish Rifles (Cameronians), eldest son of Dr. James S. Rennie, of Coatbridge, Glasgow, killed October 23rd, aged 23. He was a medical student.

Stuart, Kenneth Bruce, second Lieutenant Durham Light Infantry, only son of Dr. Robert Stuart, of Durham, killed on November 5th, aged 20. His commission was dated October 5th, 1914.

MEDICAL STUDENTS.

Bailey, Ernest, Second Lieutenant King's Liverpool Regiment, first reported as missing on October 28th, subsequently as killed on that date, aged 24. He was the third son of the late Mr. Samuel Bailey, of Blackpool, and was in his final year as a dental student in Victoria University, Manchester, when he enlisted in the Public Schools Battalion of the Royal Fusiliers at the beginning of the war. He had served with them at the front for nine months, when he was given a commission on August 4th, 1916, and returned to the front on September 7th.

McClelland, S. G., Second Lieutenant King's Own Scottish Borderers, reported missing at Loos on September 25th, 1915, now presumed killed on that date. He was the fourth son of Mr. Alexander McClelland, of Pollokshields, and of Buenos Aires, was educated at Dollar Academy, and was a medical student at Glasgow University when he got a commission on on December 16th, 1914.

University of Aberdeen.

For the following particulars regarding the careers of medical alumni who have lost their lives in connexion with the war we are indebted to the Memorial Number of *Alma Mater*, the Aberdeen University magazine.

Died on Service.

Surgeon Herbert Mather Jamieson, R.N., died at Malta on September 26th, 1915, aged 33. He graduated M.B.Aberd. in 1904, and for a number of years served as a surgeon in the mercantile marine. At the beginning of the war his ship was commandeered for transport work, and he volunteered for service with it. He was wounded off Gallipoli, but after recuperating for some time at home, he rejoined his ship, and died whilst still serving at Malta.

Medical Students.

Sergeant John Alexander MacCombie, 4th Gordons, died from wounds received in action on July 23rd, aged 21. He was educated at Gordon's College, and entered Aberdeen University in the winter of 1913 as a medical student, and at the outbreak of war had completed his first professional examination. He was a keen football player, a good shot, and very popular with his fellow students.

Private Gilbert Pirie, 4th Cameron Highlanders, was killed in action in France in August last, aged 21. He was a medical student at Aberdeen University in 1914–15; he entered the army in November, 1915. He came back in March, 1916, and completed his first professional examination while in khaki, and had only been in the trenches three days.

Private David George Melrose Watt, R.A.M.C., who died in hospital at Aldershot on April 26th, 1916, aged 19, was a medical student at the University of Aberdeen. He was not of very robust physique, and the training at Aldershot proved rather severe for him. He contracted influenza, and during convalescence complications set in which proved fatal. At the time of his illness he was arranging to undergo three months' training in a bacteriological laboratory, previous to being sent abroad in the sanitary section of the R.A.M.C.

NOTES.

Honours.

The French Croix de Guerre, gold star, has been awarded to Dr. Mildred E. Staley, who has also been mentioned in French army orders for work done in France and Corfu.

The following members of the personnel of the Medical Corps have been granted the Distinguished Conduct Medal (*London Gazette*, November 14th):

R.A.M.C.—Sergeants J. W. Hastings, A. Maclean, R. P. S. Martin, W. Pearce, F. Sullivan, J. W. Wood; Privates F. Hudson, G. Hunter, J. Lammirman. Corporal H. Meakins, R.A.M.C., receives a bar to his D.C.M.

Australian A.M.C.—Sergeant W. Storey, Private W. H. Turner.

Canadian A.M.C.—Sergeant A. E. Wartman, Private R. S. Collin.

New Zealand A.M.C.—Sergeant-Major H. R. H. Beauchamp.

Hospital for Permanently Disabled Officers.

A special hospital is being established at St. John's Lodge, Regent's Park, N.W., for the accommodation of officers of His Majesty's navy or army who have had to leave either service owing to permanent disability or paralysis caused by gunshot wounds or injury during the present war. Sir John Ellerman is bearing the entire cost of the necessary alterations and of the equipment. He has also undertaken to defray all expenses for one year, and the hospital will be known by his name. It will be ready to receive officers about January 1st, 1917. At present it will not be possible to admit cases needing active surgical treatment. Cases of tubercle, epilepsy, malignant disease, and paralysis due to medical origin are not eligible for admission.

St. John's Lodge, which was until recently the residence of the Marquess of Bute, is not only in the midst of Regent's Park but is surrounded by nearly seven acres of timbered gardens, in which patients will be able to enjoy open-air life in complete privacy, while its nearness to the centre of medical life in London will afford opportunities to them of benefiting by the best medical and surgical skill. Among those who have joined the honorary staff are: Sir David Ferrier, Sir Malcolm Morris, Sir StClair Thomson, Mr. Lewis Smith, Mr. A. W. Ormond, Mr. James Sherren, Mr. Walton Read, and Mr. A. D. Reid. The British Red Cross Society has formed a committee of management, and Sir Arbuthnot Lane is chairman of the house committee. Particulars of all cases recommended for admission to the hospital should be submitted to Dr. R. Fox-Symons, British Red Cross Society, Room 91, Pall Mall, S.W., who will supply a special form of application.

A Proposed Red Cross Museum.

In a letter which appeared in the *Times* of September 11th, 1916, Sir John Furley recalled the fact that several years ago he submitted to the late Lord Wantage a scheme for standardizing ambulance and hospital appliances, especially in relation to the transport of injured persons. For that purpose he proposed that a museum should be established where any object accepted by a committee of experts should be exhibited for a year. If at the end of that period it was found that they had been made obsolete by later invention, the improved models should be substituted for them. In this way an end would be put to what has frequently occurred recently when inventions condemned long ago as unfit for use have been adopted and sent abroad as new and useful vehicles for the carriage of wounded men. A Red Cross museum would include illustrations of the work of the ambulance column and of the various types of splints and bandages, from the rough and ready forms used in first aid to the ingenious inventions devised during the present war. It could be used for the instruction of Voluntary Aid Detachments or men of the R.A.M.C. We agree with the *Museums Journal* that the best plan would be that the British Red Cross Society should take the matter in hand, and instead of discarding from the exhibition appliances which have been considered unsatisfactory or superseded, it would be well to preserve them, with indications of the reasons for which they have been condemned as defective. The historical part of the museum should be kept distinct from what may be called the living section. It would have the twofold advantage of showing the development of inventions for the aid of the sick and wounded and preventing waste of inventive energy in the rediscovery of old things thrown aside. It should not be forgotten, however, that in the scrap-heap of inventions what Falstaff calls the "forgetive" brain of man may find new inspiration. This is a day of revivals in the whole apparatus of war, when devices thought to be dead seem to cry out, *Exoriare aliquis nostris ex ossibus ultor*. This may well hold good in regard to life-saving as well as to murderous appliances.

Gifts to the Belgian Army.

The King and Queen inspected in the grounds of Buckingham Palace on November 18th two new bath caravans and a motor field operating theatre, presented by the Wounded Allies Relief Committee to the Belgian army. The bath vans, constructed to the design of Mr. J. R. Anderson, M.I.M.E., each carry twelve light steel baths, 5 ft. 3 in. by 2 ft. 2 in., nested one within the other, and waterproof sheetings with light spars and poles to form tents, each of which can accommodate six baths. The water is heated by petrol, and it is calculated that a caravan will supply baths for 800 men in fourteen hours. The motor field operating theatre is made after the design of Sir William Collins, and is constructed on the same principle as that recently presented to the Italian Red Cross (August 19th, 1916, p. 271).

Since the beginning of the war the Department of Health of the City of New York has sold £41,000 worth of antitoxin. Two-thirds of the amount has been bought by the Allied powers.

Scotland.

The Aberdeen Roll of Honour.

Alma Mater, the Aberdeen University Magazine, has issued a memorial number in honour of those of her sons who have given their lives for their country. Principal Sir George Adam Smith contributes a foreword, in which he states that of nearly two thousand graduates, students, and alumni who have gone on service, one hundred and eight have already fallen in action, gone down in their ships, or died of disease, while nearly two hundred others have been reported wounded. Of the fallen some thirty-seven were still students from 18 to 24 years of age, most of them not more than 21. Some forty-three had graduated or finished their studies since 1909, and were all under 32. The rest were in the prime of life, only two or three having graduated as far back as the Eighties, and being about 50 years of age. The memorial number is beautifully printed on excellent paper, and contains forty-two full-page photographs. Among them are four of graduates in medicine and seven of medical students. This list includes all who were killed down to August 4th,

1916. To these must be added seven medical graduates and four students who have lost their lives since that date. The number, which will be a touching memorial of the great war to all members of the University of Aberdeen, does the highest credit to all concerned in its production. It is published for the Students' Representative Council by W. and W. Lindsay.

Open-air School in Glasgow.

An open-air school for scholars taking a supplementary course, designed and carried out by the staff of the Glasgow School Board, was opened on November 18th. It stands at the corner of Boden and Bernard Streets, Bridgeton, and the site has an area of 8,071 square yards. The school is in two stories and contains twenty-two ordinary classrooms, each providing 15 square ft. for each of forty scholars. In addition there are two art rooms, two manual rooms, two physical laboratories, two cookery rooms, one laundry room, two dressing rooms, one sewing room, and a housewifery department consisting of two rooms, kitchen, bathroom, and classroom for twenty pupils. A library and a suite of rooms for the medical inspection of children are provided. In a separate building is a drill hall and gymnasium 120 by 30 ft., but capable of being divided by a folding partition. Attached to the drill hall are two dressing rooms and two private rooms for instructors. In a separate building twenty spray baths are provided in separate cubicles. The entrance doors of the classrooms, 8 ft. wide, are hung to open to an angle of 180 degrees so as to give an open-air classroom. The windows are double hung with ventilating screens. The blocks are connected by external corridors. Garden plots have been formed in the playground. There is a rest room for girls, and the cloak rooms are fitted so that each pupil has a double peg with a number. The building is warmed by a low-pressure hot-water system heated by three boilers, assisted by an electric pump.

A Tuberculosis Colony.

The local authorities in the district of Mid-Lanark in Scotland were among the first to appreciate the need for combined effort in the campaign against tuberculosis. By means of sanatoriums, acting in conjunction with hospitals, they have been able to deal with a large number of consumptives in various stages of the disease, but their experience has led them to realize that more is needed. Like so many associations interested in the subject, they have been forced to the conclusion that the expensive treatment of a consumptive worker for three months is only too liable to prove inadequate and wasteful when, on return to work, the insidious disease becomes active once more. Hence the Lanark authorities have decided to adopt a more radical scheme by the founding of a colony in which convalescence can be carried on in favourable hygienic surroundings for indefinite periods, under partially industrial conditions. A large institution is in course of erection at Hairmyres, about eight miles south of Glasgow, on a piece of ground 200 acres in extent. The buildings, when complete, will be spread over 30 acres. The feature of the undertaking is essentially educative as well as curative. The patients, most of them more or less connected with the mining and steel industry, are to be instructed in farming, market-gardening, and forestry; men, women, and children being equally provided for. In connexion with the undertaking a large tract of land, 6,000 acres in extent, is to be utilized for the study and practice of scientific forestry by those patients who have arrived at a stage of convalescence which will enable them to live the open-air life of the lumberman. Dairy farming and the maintenance of a herd of Ayrshire cows specially exempt from tuberculosis will supply occupation for women and pure milk for children. Incidentally it is stated to be a fact that 90 per cent. of the cases of cervical glandular trouble occurring in Edinburgh are due to the ingestion of tuberculous milk. A further prospect of usefulness is held out by the offer of treatment to disabled soldiers. The details of this bold experiment were recently made public by the Chairman of the Middle Ward District Committee of Lanarkshire for the treatment and cure of tuberculosis. The results which it may succeed in achieving will doubtless be made equally public in due course.

Ireland.

At the last meeting of the Dublin County Council a resolution was unanimously adopted calling upon the Government to establish a hospital for Irish soldiers and sailors suffering from incurable diseases arising directly or indirectly from the war, as there was no such institution in the country.

The annual collection for the Dublin Hospital Sunday Fund was made on November 12th in 315 places of divine worship. The fund assists sixteen hospitals and convalescent homes. These hospitals provide about 1,637 beds for the sick poor. The annually receive upwards of 19,105 patients, and relieve many thousands at their dispensaries, while their staffs attend upwards of 4,055 lying-in women at their own homes, and treat as extern patients upwards of 47,161 accident cases.

Doctors of Military Age.

In pursuance of its policy of refusing to sanction the appointment of doctors of military age to dispensary districts, the Local Government Board has refused to sanction the appointment of Dr. McGowan to the Bridewell dispensary district, Athlone, but the guardians have appointed him temporarily. The Local Government Board has also refused to sanction the appointment of Dr. J. O'Mullane to be temporary medical officer of the Slievereagh dispensary district. The guardians, in reply, have stated that they had proposed to make the appointment in view of the fact that the temporary medical officer resided at a distance of twenty-five miles from the extreme end of the district, which was mountainous, so that hardship was inflicted on poor persons.

Anterior Poliomyelitis.

Dr. C. E. Crean, Ballyhaunis, has reported to the Claremorris Council that he found four children at Tavenaghmore, the eldest aged 8 years, suffering from acute poliomyelitis, and that the schools had been closed. The Swinford Council have given notice to adopt the Infectious Diseases (Notification) Act in the district. The Monaghan Urban Council has decided to make poliomyelitis and cerebro-spinal meningitis compulsorily notifiable diseases. An outbreak of poliomyelitis has occurred in co. Cavan, and a few isolated cases about Carrickmacross. A committee was appointed to consider the adoption of a scheme for the care of infant life.

Vaccination Prosecutions.

At the Cabinteely Petty Sessions last week the Rathdown Board of Guardians prosecuted a man for neglecting to cause two of his children to be vaccinated within three months after birth without reasonable excuse. The defendant said that two of his children had nearly died from vaccination, and no doctor could certify that vaccination was an antidote to small-pox. A fine of 3s. 6d. and costs was inflicted in each case, with the alternative of seven days' imprisonment. A similar charge against another man was adjourned for fourteen days, and another was withdrawn owing to the illness of the child.

England and Wales.

An agreement has been sealed between the City of London Corporation and the governors of St. Bartholomew's Hospital for the establishment of a dispensary in the City for the treatment of tuberculosis at an annual cost not exceeding £700.

Midwives and Maternity and Child Welfare in Lancashire.

The Lancashire County Council has had under consideration a report of its Public Health and Housing Committee, which states that a joint subcommittee of the Public Health Committee and the Midwives Act Committee had recommended that a beginning should be made of a scheme for the administration of maternity and child welfare work. The committee was, however, of opinion that it was inadvisable to attempt to bring a complete

scheme into operation during the war. It recommended that for the present a scheme of home visitation should be adopted limited to certain urban districts in which no health visitors have been appointed by the local sanitary authorities. This, with the action already taken by other local authorities, will provide for a population of 1,300,000, leaving about 350,000, principally in rural areas, for which no provision will have been made. Fourteen health visitors will be required and a grant of £3,000 per annum will be needed. The proposal is subject to the approval of the Local Government Board being obtained and to the Board refunding one-half of the expenditure, the remaining cost falling on the districts affected.

The Midwives Act Committee reported that the number of midwives on the county register on September 30th was 930, of whom only 711 were in actual practice. Of the total, the large proportion of 478 were on the register simply by virtue of having been in bona fide practice before the Midwives Act came into operation. The records of sending for medical assistance numbered 590 in the quarter ending September 30th, by far the largest number being for obstructed labour, uterine inertia, need for instrumental assistance, or for treatment of ruptured perineum. During the quarter twenty-three cases of puerperal fever were notified, with five deaths, and information was received from all sources of eighty-five cases of ophthalmia neonatorum. Each case which occurred in the practice of midwives was investigated, with the result that in seventeen cases negligence on the part of a midwife was discovered, the offence in most cases consisting in delay in securing medical attention.

Hong Kong.

Health Report for 1915.

The annual report on the health of the colony of Hong Kong for the year 1915 shows an estimated civil population of 509,160, of whom 495,840 are Chinese; naval and military figures have been omitted since the outbreak of the European war. The birth-rate among the non-Chinese community was 13.2 per 1,000, while among the Chinese it was 8.4 per 1,000; in past years the male births among the non-Chinese have usually exceeded the female births by about 10 per cent., but during 1915 the figures were reversed, and there were only 92.4 male births to each 100 female births. Among the Chinese, however, the proportion was 152 males to every 100 females, which does not differ greatly from the records of previous years.

The death-rate for the year was 9.4 per 1,000 among the non-Chinese and 19.0 per 1,000 among the Chinese. Deaths from pulmonary tuberculosis among the Chinese represented 10.1 per cent. of the total Chinese deaths, while pneumonia was responsible for an even larger proportion of these deaths. There were 366 deaths from malaria, all but 4 being in the Chinese community, and 398 deaths from beri-beri, 5 of which (3 Japanese and 2 Indian) were non-Chinese.

The incidence of plague during the year was light, the total cases numbering 144, as compared with 2,146 in 1914; the proportion of plague-infected rats among the 94,093 examined in the city was only 0.023 per cent., while among the 15,816 examined on the mainland (Kowloon) it was 0.48 per cent.; it is not surprising, therefore, to find that the human cases on the Kowloon side numbered 83 out of a population of 73,100, while on the island they numbered 42 out of a population of 274,950.

Typhoid fever was more prevalent than usual, the total number of cases reported being 198, of which 30 were imported; 36 of these cases occurred among Europeans, and 128 among the Chinese, the remainder being other Asiatics. Paratyphoid fever is now a notifiable disease, and three cases were reported, of which one died. Cholera was responsible for 11 deaths, small-pox for 29, and diphtheria for 55. A European woman arrived from Canton suffering from typhus fever—a disease which is practically unknown in the colony—and was fortunate enough to recover.

It is proposed to establish a research laboratory in memory of Dr. Earl C. Peck, assistant resident physician at the Philadelphia Hospital for Contagious Diseases, who died recently of anterior poliomyelitis.

Correspondence.

STUDENTS AS HOSPITAL HOUSE OFFICERS.

Sir,—Some time ago correspondents in your columns hinted at the possible shortage of medical men, not only at the present time, but after the war also; this latter shortage being due to the number of Royal Army Medical Corps officers being killed, dying on active service, or being maimed. Not only is this wastage of war likely to be felt, but a further loss must result owing to the number of medical students serving as combatants and from the diminished entry of men into our medical schools.

The war has already brought about many changes in our organizations, and the present may be a fitting opportunity to consider and revise some of the features of the medical curriculum.

The shortage may be partly overcome by a process of speeding up the production of medical men. This may be helped by adopting the long-discussed reform of relegating the study of the preliminary sciences to school life and combining the test of their proficiency with the entrance examination. It is to this that I would draw attention and especially to its effects on the hospitals.

At the present time a considerable number of our hospitals have for resident officers fourth or fifth year students. Here, at all events, they have given every satisfaction—indeed, except for the fact of their being unable to give death certificates, one would hardly recognize the difference.

That it would be of the greatest advantage if each student could have a year's residence as house-surgeon or house-physician I suppose few can deny. Those who have held such posts always refer to them as periods of the greatest value, while those who have not must often be painfully conscious of the fact.

Such a period of residency for all might be possible under a rearranged curriculum which would remain at its present length. At the end of the fourth year, under such a revised arrangement, a student would be equal to one of the present at the end of his fifth year—be ready for the final examination. The fifth year should be free from lectures, and should be devoted to resident appointments, the final examination being taken at the end of this period.

This would benefit the hospitals by saving the salaries of the present house officers. Each large institution might retain only qualified resident surgical and medical officers, while the teaching schools might retain the men who have done best in their examinations. Each school might act as a source of supply to the surrounding smaller hospitals, and this constant infusion of new blood as resident students each six months would materially benefit them and their honorary staffs, who would be encouraged to keep up to date and do some teaching. It would help also to distribute students more evenly, for, while some hospitals are overcrowded, others with an abundance of clinical material and facilities for individual work are handicapped by a dearth of helpers. The change would improve the armamentarium of the students by allowing all the opportunities of having cases under their charge, yet under supervision, and would no doubt be reflected in the character of their practice. It would imitate to some extent the old system of apprenticeship, which many lament the loss of to-day, and would also relieve the students financially by giving them board and lodgings for one year.

Whether the hospitals of the country are capable of accommodating the total number of final year men could be easily ascertained. In any case extra residents would greatly benefit many hospitals, and would improve the keeping of records, and allow more research to be carried out than at present obtains.

I believe that by these means considerable advantage would accrue not only to the efficiency of the profession, but to the hospitals and public generally.

The change would involve no very drastic alterations, as it seems likely that before the war is over qualified residents will be unobtainable.—I am, etc.,

Newcastle-on-Tyne, Nov. 11th. Frederick C. Pybus.

FEES OF PHYSICIANS AND SURGEONS.

SIR,—The controversy as regards adequate fees for physicians and surgeons is one which must give rise to difference of opinion according to the standpoint of the man who accepts the remuneration for his services. A general practitioner with a large practice might possibly be in a better position than any one else to estimate the value for money received. Though not in general practice now I can claim to have had many years' experience, and still have many opportunities of observation.

"The higher branch" of the profession—I quote Dr. Mercier—may be underpaid; but why "the higher branch"? Surely the time for this has gone by. But when it comes to describing a surgeon as a mechanic, or as a person employed by a physician to carry out his instruction, the height of absurdity is reached. Personally, I should be very sorry to allow any physician to decide for me that no operation should be performed if I was supposed to be suffering from acute appendicitis, and a surgeon of repute and experience insisted that an immediate operation was necessary; and if the surgeon definitely gave the latter opinion I should consider myself a fool if I called in a physician with a view to overriding this opinion. It seems to me in such a case that it is nonsense to say that the latter is called in to decide the point of operation or not; he is called in because the patient (or his friends) hope for a backstairs escape from operation which the great man of the "higher branch" may offer him. How many lives have been lost by temporizing in such cases? We all know of many. How many, on the other hand, have been saved by immediate surgical interference? Innumerable; and if the patient dies he does not die from the operation, but from the condition for which the operation is done.

Surely the well educated, experienced surgeon of the present day is fully entitled to the fees he earns, and if the physician considers that his remuneration is inadequate, it is up against him to prove to the profession and the general public that his services are of greater market value. This he should be able to do without casting a slur on the professional ability of the surgeon to decide the point as to whether an operation is necessary or not. On what grounds of education, ability, or experience is a physician in any position to abrogate to himself any special knowledge, etc., which a surgeon cannot at any rate equally possess; and the surgeon has in addition a great asset inasmuch as he knows the condition found at, and the results obtained by, the numerous operations he has performed. God help us all, and our patients too, if the ultimate court of appeal as to the question of operation is to be the opinion of a physician.—I am, etc.,

Liverpool, Nov. 20th. C. THURSTAN HOLLAND.

SIR,—The interesting correspondence on this subject in your issue of November 18th raises a point of considerable importance other than the purely financial one. I refer to the question of diagnosis and the responsibility in regard to operations. If the art of the surgeon has been unduly magnified in the past, the responsibility for this rests, I believe, to a great degree with the physicians themselves. I do not think it is an exaggeration to say that the tendency to rely on the surgeon for the diagnosis of a large and important group of abdominal conditions has become more and more pronounced in recent years, and is a result of the failure of the physician in many instances to make the necessary thorough examination by modern methods. There are undoubtedly a few cases in which even after a careful application of the *x* rays, repeated investigation of the stools, and careful bacteriological examination of the urine, the physician may still be doubtful as to the advisability of operation and the best method for operative procedure. But these cases are few in number, and will diminish in proportion to greater thoroughness in our methods.

The trend of modern developments is well illustrated in the case of a young lady, who did not appear to be seriously ill, who consulted me about six months ago. She complained of various symptoms indicative of a general neurasthenic state, largely arising from constipation. She had been advised by lay friends to consult a surgeon. After a general examination, including the limited application of the *x* rays, the surgeon clapped her kindly on the shoulder and assured her that she could never be well until her colon was removed. This recommendation rather alarmed her, and led her to seek medical advice. A careful investigation and appropriate medical treatment, carried out at little inconvenience or expense, served to establish a very satisfactory state of health.

It would be interesting to hear the opinion of others on the point raised. My own position is quite definite. In the course of the last four years, in a series of over 150 cases submitted to operation in my private or hospital practice, I have in no instance—I exclude acute cases—called in a surgeon to assist in the diagnosis. I accept the full responsibility for the recommendation of an operation, and in many instances indicate clearly to the patient that the operation is a necessary preliminary step in the treatment. In that series I have failed on two occasions only to convince the surgeon called in as to the soundness of the procedure recommended. In the first of these I had no difficulty in convincing another surgeon as to the wisdom of the course suggested; the other patient—a nurse suffering from glycosuria with intestinal complications—decided to follow the opinion of the surgeon who saw her for a few minutes rather than the physician who had studied her case closely for weeks. She died some months later from intestinal obstruction.

If there is at present any serious disproportion in the relative emoluments of the physician and surgeon, this will, I believe, soon right itself with the education of the profession and of the public as to the relative importance of the work done.—I am, etc.,

Edinburgh, Nov. 18th. CHALMERS WATSON.

SIR,—Dr. Mercier's remark that a surgeon is the servant of the physician and exists to carry out the latter's behests shows something more than mere bias, and will not, of course, be taken seriously. It is regrettable, I think, to talk of physicians as "the higher branch of the profession." Surely the physician and the surgeon each has his own distinctive place and use, and there should be no question of "superiority" on either side. No surgeon worthy of the name would dream of operating against his own judgement, however many physicians advised him to do so. In many cases the surgeon is more competent than a physician to decide the advisability of operation and the likelihood of success. Perhaps Dr. Mercier will give surgeons credit for occasionally examining the heart, lungs, and urine before undertaking a serious operation!

With his other remarks I fully agree. The disproportion between surgeons' and physicians' fees is ridiculous. When one considers that a surgeon, for perhaps half an hour's work, often receives what a physician would receive for fifty consultations (each taking anything up to an hour) the utter unfairness of the remuneration is apparent. If the surgeon's fee is fair, then the physician's is hopelessly inadequate. I quite admit that the surgeon should receive a good fee, for the patient's life is in his hands, and may be lost through an error in judgement or technique; it takes constant and long practice to acquire the needed dexterity, and the anxiety and responsibility attached to a big operation are great. After all, it is a question of what a particular surgeon's services are worth to the patient, who thinks, rightly or wrongly, that he will do the operation better than any one else, and is therefore willing to pay an "excessive" fee. No one can blame a surgeon for refusing low fees if he can keep fully occupied when charging high ones.

Coming to the other side, I agree with Dr. Mercier that, on the whole, a physician's work is on a higher plane than a surgeon's, and, taking case for case, demands more time and brain work. Physicians should therefore, I think, be recompensed more fully for their work than they are.

When did surgeons' fees begin to rise so greatly, and why? That is, what is the history of the matter? I imagine that one reason is the fact that a surgeon's work is so much more spectacular and the associations of operations so impressive (and the results obvious to even a "dull" patient), whilst a "medical" case on whom no end of care and skill has been expended often hardly realizes the fact. Whilst it is certainly true that the whole scale of fees needs revision, I do not see how this is to be done in surgical cases, although united action by physicians would put them on a better footing.

What has long seemed to me a most pressing need is the provision of surgical aid for patients of moderate means who cannot afford high fees but who are above the hospital class. The lack of such provision results in these

patients getting into hospital, which is both an abuse of the latter (unless they pay something), and, as hospital residents well know, is a gross injustice to poorer patients (often suffering from urgent or painful conditions), who have to wait their turn on the hospital waiting list. One way in which this abuse could, to some extent, be remedied would be by surgeons who can command big fees handing on such cases to their juniors—but perhaps this is utopian. I have tried to discuss the matter fairly as one who is equally interested in both sides of the question.—I am, etc.,

G. W. Thomas, M.B., B.S.Lond.,
F.R.C.S.Eng.

Wakefield, Nov. 18th.

Sir,—I always look forward to a little entertainment and instruction when I see a letter written by Dr. Mercier. His pen is witty, and so far as I know (not being a mental specialist) his ideas are rational. At any rate, I enjoy his views on psycho-analysis.

But I am wondering where of late years he has made contact with surgery. "Scratching a child's throat with the finger-nail" is, I take it, Dr. Mercier's humorous way of referring to the method of removing adenoids which was given up over twenty years ago. I wonder how many throat surgeons receive the thirty guineas for this operation which Dr. Mercier thinks usual.

How would Dr. Mercier like to instruct a surgeon on the subject of gastric ulcer? Would he do it before the operation? Gastro-enterostomy performed upon a pre-operative symptomatic diagnosis (which, by the way, is the only one a physician can make in such a case) may be one of the most disastrous operations in surgery. Or should the physician come to the operation and direct his mechanic "whom he employs to carry out his instructions"? If an ulcer is found, would he then decide for the surgeon whether he should perform partial gastrectomy, exclusion of the ulcer from the stomach, pylorectomy, or gastro-enterostomy, all of which questions arise? How is he with his lack of knowledge of the difficulties and dangers, the methods of obtaining the best results, to direct his mechanic? He would have to be able to do the whole thing himself to be in a position to direct any one else how to do it. Then why employ the surgeon? Thus "the anomaly of the servant (or surgeon) being remunerated on a higher scale than the master (or physician)" would be obviated.

Dr. Mercier says that when the physician acts as his own surgeon he realizes how much more onerous, responsible, and difficult is the task of the former. Surely, but then why not leave it to the surgeon? The question of "on how much higher a plane is the work of a physician than that of a surgeon" might be left to that bold physician and his patient (or the sorrowing relations). Operations are not to be compared with the repairing of a watch. If a watch is ruined you can buy another. You cannot buy a new life.

I will quote once more from Dr. Mercier: "The remuneration for work ought, I suggest, to bear a relation to the gravity of the issue determined, the time occupied, and the skill required." I would add, "and the benefits conferred." Well, for surgical operations, I suggest, it does, and that is why patients are willing to pay the present scale of fees.—I am, etc.,

Joseph Cunning.

London, W., Nov. 20th.

VENEREAL DISEASES IN THE ARMY.

Sir,—Mr. E. B. Turner's plea that it would be hardly expedient to publish the actual figures and facts on which he bases his conclusion that there is a very large amount of venereal disease both at home and at the front inclines one to think that he is qualifying for the diplomatic service or a seat in the Cabinet. He is evidently not an emissary of the *Daily Mail*, otherwise he would not advocate "hide the truth." These diseases may be, and no doubt usually are, contracted in the dark, but that is the greater reason why we should throw a flood of light on them. I have hitherto been under the impression that the only secrecy which medical men were called upon to preserve was the professional secrecy which exists or should exist between them and their patients. Why should Dr. Barrs have the figures for his own private information? If I read Dr. Barrs's letter aright he does not want the information for himself but for the public. My experience is similar to his: out of many thousands of sick and wounded soldiers from all parts of the front I have seen very few cases of venereal diseases. I have no means of accurately ascertaining the incidence of these diseases at the front, but I have been told by officers that such are fairly common—which may mean much or little; nor do I know what preventive measures are being adopted, but I hope they are not following the *laissez faire* method of this country. One young officer told me that there is a small but select health resort for officers in the north of France, but none down the line for the men. I should like to ask Mr. Turner or any one else to investigate the condition which recently prevailed at a camp in this do-nothing country, and I would then ask him, Is it fair to put the virile sons of Australia, who have come over to fight our battles, in a hotbed of disease?

The publication of the figures could not militate against the defence of the realm. In the success of the campaign it does not matter whether the incidence be a tenth per cent. or ten per cent., so long as we can keep a sufficient number of effectives in the fighting line. It does, however, very much matter to the army if we allow these diseases to spread so as to knock the effectives out of the combat. Here, as in every other disease, prevention is better than cure. Venereal diseases can be stamped out, more especially syphilis, perhaps not so easily as in the case of rabies, because those diseases are more widely spread, but the knowledge that such diseases can be eradicated should be a strong incentive to the adoption of stringent and necessary preventive measures. A brick wall, so long as its continuity is maintained, between the infected and the sound imparts absolute security. It is to me pitiable to see members of the Council of the British Medical Association utterly ignoring prevention, and devoting their energy, not so much to questions of treatment, as to how much can be made out of these diseases. Pious resolutions are passed, and fees fixed, though it is highly improbable that they will be consulted by any public body, unless it be to find out how cheaply the work can be done.

No doubt a large number of valuable lectures are given free, preaching sexual abstinence. The soldiers are exposed to temptation and the advice given to them is to "resist the devil and he will flee from you," but if you do happen to get caught come round the corner and a benevolent State which allowed you to contract the disease will cure you for nothing. This homily should surely be sufficient to convince the men that this pleasant sin is after all not so very deadly. The advice of the sergeant to his men, "if you can't be good be careful," is of much more practical value than all these lectures.

If this country follow the lead of a lot of puritanical humbugs who "compound for sins they are inclined to by damning those they have no mind to," in a short time it will become syphilized, if not Prussianized, and no man will be considered respectable and fit to get married until he has undergone a Wassermann test and has had a dose of salvarsan. There are in this country large numbers of men who would rob their grandmothers, and yet pose as highly moral citizens simply because they have no desire to indulge in promiscuous sexual intercourse.

I am sure my friend Mr. Turner knows me well enough to feel certain that I do not place him among the self-righteous pharisees. I am merely using his letter as a peg on which to hang an argument.

I am convinced that when the women get the vote this will be one of the first social problems to be seriously and effectively tackled. Is there no statesman with sufficient intelligence to grapple with the all-important subject of the abolition of venereal diseases?—I am, etc.,

James Barr.

Liverpool, Nov. 18th.

CONTROL OF VENEREAL DISEASES.

Sir,—In your leading article on the "Alleged advantages of compulsory notification of venereal disease,"[1] you remark that the Copenhagen statistics compiled by Professor Pontoppidan (quoted in the same number of the Journal) are inconclusive. This may be true from the statistical point of view, for the evidence is incomplete.

[1] British Medical Journal, October 28th.

On the other hand, when looked at from another point of view, they may be used as an argument in favour of compulsory treatment, at any rate as regards prostitutes. These statistics show that in the seven years following abolition of the regulation of prostitution in Copenhagen the number of males treated in hospitals for venereal diseases was more than 3,000 in excess of the number treated in the seven years previous to abolition of regulation. On the other hand, the number of females treated during the same period showed a diminution of nearly 8,000. The latter figure can be disregarded, for, as Professor Pontoppidan admits, the number of women treated in hospital would naturally diminish after abolition of the systematic examination and compulsory treatment of prostitutes. Now, as the males presumably contracted these diseases from the females, the most probable explanation of the increase in incidence among the males is a general increase in the prevalence of venereal disease after the abolition of the regulation of prostitution. The only other way in which such an increase could be accounted for would be a proportionate increase in the population, concerning which no mention is made, at any rate in the quotation published.

At the recent meeting held at the Mansion House at the request of the National Council for Combating Venereal Disease Sir Thomas Barlow is quoted as saying "that notification is a fetish and compulsory treatment impossible." On the contrary, although the application of such measures to the whole population presents great difficulties, much can be done, and much is being done, by compulsory treatment. The majority of males of the age during which venereal disease is usually contracted are now in the new army, and are under the control of what is practically a system of notification and compulsory treatment. If this system could be applied to the females, who are now under no control and free to spread these diseases, there would be a much greater chance of reducing the prevalence of venereal disease than by means of lectures and pamphlets, which, though excellent in their way, do not reach those who are the most dangerous sources of infection—the prostitutes, both amateur and professional, and the fundamentally vicious.—I am, etc.,

C. F. MARSHALL.

Military Hospital, Prees Heath, Nov. 7th.

SIR,—It is earnestly to be hoped that the recommendations in Captain Curl's letter in the JOURNAL of November 11th, p. 668, will be carried out, especially with regard to making appointments during the war. It would surely be manifestly unfair to those now serving to have permanent appointments made, whilst many men, thoroughly qualified for this type of work, are precluded from applying for them.

The co-operation of civilian medical men and officers of the R.A.M.C. seems the only feasible way of dealing with this problem, at any rate at the present time, when the alleged increase of venereal diseases is occupying the attention of both civil and military authorities.—I am, etc.,

R. M. WALKER, M.D.,
Temporary Captain R.A.M.C.

Cromarty, Nov. 12th.

THE ANTHROPOMETRIC SIDE OF RECRUITING STATISTICS.

SIR,—I have read the article in the BRITISH MEDICAL JOURNAL of October 28th, p. 594, on the anthropometric side of recruiting statistics. I have been discussing this subject for some months with fellow officers, and hoping that the unique opportunities afforded by this physical census of the nations would not be allowed to be wasted.

One very valuable result which could be secured by simple instructions to medical officers is, that at demobilization or previous discharge every man should be weighed, measured in height and chest expansions, and the results entered, with date, upon his Medical History Sheet (A.F.B. 178). This would afford most valuable information as to the result of military training upon the manhood of the country.

Statistics as to diseases prevalent in different parts of the United Kingdom would be useful and easily obtained from the remarks made on the Medical History Sheets by the Recruiting Medical Boards; these vary in fullness of detail, some boards putting very little, and others giving a full statement of conditions found at examinations. I think, however, that a sufficiently large number of medical history sheets would be found fully entered to afford a generous basis upon which valuable generalizations might be founded.

The great frequency of severe varicose veins of the feet as well as leg and thigh in some districts, and their infrequency in others, would be noted, and provoke consideration as to cause.

In some boards large numbers of cases of enlarged thyroids have been found. The occurrence of hernia in certain counties where work is not of a peculiarly heavy nature is a problem awaiting solution. The frequency of appendicitis, retained testicles, retinitis pigmentosa, and severe psoriasis would be easily recorded. All of this could be secured with a minimum amount of trouble. And it is likely that very small additional particulars suggested by an expert on medical statistics might greatly enhance the value of such a research.—I am, etc.,

J. RUTTER WILLIAMSON, Captain R.A.M.C.,
President of a Recruiting Medical Board.

November 10th.

THE USE OF TURPENTINE IN SURGERY.

SIR,—In these days when it is scarcely possible to pick up a medical journal containing no reference to the burning question of the best method of treatment of septic wounds, when new processes are being devised almost daily and being boomed enthusiastically by their sponsors, there is a risk that old and tried remedies may be forgotten. One of these is turpentine.

Who of us practising military surgery has not been confronted with a case of secondary haemorrhage in which the tissues are so rotten and sloughy that to ligature bleeding points seems almost useless, and a recurrence of bleeding inevitable?

In such a case turpentine is most valuable. If the bleeding be arrested, and the wound lightly packed with gauze wrung dry out of turpentine, the result is most gratifying. When the packing is removed in twenty-four to forty-eight hours, the change in the condition of the wound is remarkable. No excess of turpentine should be used, and none on the outside dressing, or else the skin will be blistered, small matter though that is compared with the arrest of the haemorrhage. In eighteen months' practice as a military surgeon all my cases of secondary haemorrhage have been so treated. All have recovered, and in none has bleeding recurred.

The use of turpentine in this way was a favourite remedy of Mitchell Banks, whose opinion is quoted with approval by Jacobson in that most valuable of all surgical textbooks, *The Operations of Surgery*. Nowadays it is unfashionable to be conservative, but not all the old-fashioned remedies are useless.—I am, etc.,

C. A. MOORE, Captain R.A.M.C.(T.).

Clifton, Nov. 6th.

PREVENTION OF CANCER.

SIR,—Much good and very little harm has been done by teaching people how to prevent tuberculosis, and it is perfectly possible to save many lives annually by making public use of the information we already possess as to the prevention of cancer.

On July 1st, 1914, in my capacity as M.O.H., I printed a report summarizing the causes of chronic irritation which frequently results in malignant disease when neglected. This information was so compiled as to obviate all fear of morbid introspection. This was shown by the Local Government Board to the Secretary of the American Society for the Control of Cancer, and their council (consisting of medical men) had it forwarded to all health officers in the United States and Canada.

Why should we withhold preventive treatment until the precise causation and treatment of the disease is assured? In view of the age at which its appearance is most frequent, cannot local and general treatment be adopted, especially after early operation for removal, to keep the cells as virile and healthy as possible and to preserve the normal hormone balance?

If, as I think, cancer implies a resuscitation of ancestral reproductive faculty in cells, preventive treatment will eventually have to be conducted upon such lines—why not now? Why should not the public be informed that pain

is not an early sign of cancer, and that the causes of excessive haemorrhages in middle life should be dealt with?—I am, etc.,

J. ASPINALL MARSDEN,
Lieutenant R.A.M.C.

Lightcliffe, Yorks, Nov 13th.

*** At the suggestion of the Section of Obstetrics and Gynaecology of the annual meeting of the British Medical Association at Exeter in 1907 the Council of the British Medical Association appointed a committee to consider the best means of disseminating knowledge of the importance of the early recognition of uterine cancer. The result of the labours of this special committee was the issue of a valuable memorandum appealing to m dical practitioners to promote the earlier recognition of uterine cancer. Appended to the appeal was anoth r addressed to midwives and nurses in which the early signs of cancer were pointed out.

THE POSSIBLE FUNCTIONS OF CEREBRO-SPINAL FLUID.

SIR,—I am glad to see that my address on this subject has aroused the interest of some of your readers. I need say no more than thank Drs. Lyth and Mamourian for their appreciatory remarks, and add the following extract from a paper by Professor Dixon and myself[1] which may be germane to the question raised by Dr. Mamourian. After speaking of the olfactory nerve, we go on to state that:

> Evidence of a like nature exists to show that some fluid finds its way along the sheaths of other cerebral nerves. The optic nerve is certainly the most important of these. . . . In the case of the optic nerve the coloured fluid passed out along the nerve sheath and over the posterior surface of the eyeball by way of the optic subarachnoid into Tenon's capsule.

Dr. Harry Campbell and Dr. James McIntosh both criticize the view that the cerebro-spinal fluid plays the part of the lymph of the brain. I would remind both of them that I accepted this dictum with several reservations. I sincerely hope that this is not the commencement of a long controversy, and will therefore try and reply with becoming briefness. Until Dr. Campbell brings forward proofs of his opinion that the perineuronal spaces contain protein and other substances which exude from the blood capillaries I shall continue to assume that they do not. Such evidence as is available is against Dr. Campbell's supposition. Dr. Campbell's underlying fallacy appears to me to be the idea that a nutrient fluid must necessarily be rich in protein.

Dr. McIntosh states that he cannot accept my views because he has always held other ones. I fail to see the cogency of this argument. In his concluding sentence he states that there is good histo-pathological evidence to show that the brain possesses an independent system of lymphatics which is normally quite shut off from the cerebro-spinal fluid. I sh ll look forward to his forthcoming paper in *Brain*, where no doubt the evidence he alludes to will be set down in detail. But until I know what the evidence is, I must withhold my opinion as to whether it is good or not.—I am, etc.

W. D. HALLIBURTON.

King's College, London, Nov. 17th.

*** We cannot continue this correspondence.

NURSES' REGISTRATION.

SIR,—Perhaps you will kindly allow me to make some critical remarks concerning the College of Nursing, Ltd. Put briefly, the college is a privately formed body hoping to obtain parliamentary sanction, and its object is to elevate the nursing profession by means of a system of registration, combined with the approval of suitable hospitals as training schools. This object will have the approbation of all thinking men, at least in principle, though one may well look on some of the methods adopted as capable of improvement. But I propose to deal with one aspect only of the matter, wherein it seems that the effect of the college's action can only be detrimental to the nursing profession and to the public.

So far as recognition of training schools goes, it appears that voluntary hospitals to fulfil the conditions must have 40 beds, Poor Law hospitals 250. The other two conditions are the same in each case—namely, a medical man must be in residence and a series of lectures must be given, followed by examination.

It is difficult to see why the relative sizes of the two classes of hospital should be so dissimilar. It is true that a voluntary hospital is likely to have a greater proportion of cases of acute illness and operative work; on the other hand, Poor Law nurses have a much better experience in managing bedridden cases, and this is no small asset. However, let me speak as the acting medical officer in charge of a Poor Law hospital of some 220 beds. Although there is no resident, the Local Government Board has thought fit to recognize our certificate as qualifying nurses for the highest positions in this branch of the profession, so that the College of Nursing comes into conflict with a Government department. But that is by no means all. The smaller Poor Law hospitals have for some years been improving in their standard of nursing and in their efforts to train nurses. If the College of Nursing persists successfully in its present course, all this will be done away with and the conditions of last century must recur. What sensible girl will wish to be trained at a hospital not recognized by the authority at the head of the nursing world? What capable and ambitious trained nurse will apply for a sister's post there? What sort of matron shall we get as the head of such a nursing staff? The answers to these questions are plain. The matron and sisters will be such as are fit for such a backwater; and, instead of probationers interested in their work and anxious to learn their duties, the majority of the staff will be more or less of the "Gamp" type. In place of a nursing school doing a small but (we hope) not bad work, we shall have chaos again. In turn, the patients will necessarily suffer, and all this at an increased cost to the ratepayers, for the "Gamp" will want higher pay than mere probationers.—I am, etc.,

FRANCIS VILLY.

Keighley, Nov. 10th.

AUSTRALIAN UNIVERSITIES AND THE WAR.

SIR,—I am directed by the High Commissioner to inform you that he has received the following cablegram from the Commonwealth Government in regard to the shortened curriculum at the Australian universities for medical graduates, which has been adopted with a view to supplying the graduates necessary for the Expeditionary Force and local service:

> SUPPLEMENT BRITISH MEDICAL JOURNAL August 19th reports action Executive Committee General Medical Council concerning Melbourne Medical Graduates. All Australian universities have shortened curriculum to four years and two-thirds to supply Graduates necessary Expeditionary and Local Service shortening limited to duration of war and still necessary. No Graduate admitted below this limit in any university. Four years under temporary Victorian Act provides for extreme emergency which has not occurred. Communicate Colonial Office and Council so no obstacle registration.

—I am, etc.,

R. MUIRHEAD COLLINS.

Commonwealth of Australia,
High Commissioner's Offices,
72, Victoria Street, Westminster,
London, S.W.,
November 15th.

OUR BELGIAN COLLEAGUES AT HOME AND ABROAD.

THE following additional subscriptions to the Fund have been received:

	£	s.	d.
Dr. G. D. H. Carpenter (16th and 17th donations—total, £17)	2	0	0
Queensland Branch, B.M.A., per Dr. W. H. Crago (honorary treasurer, New South Wales Branch, B.M.A.) ...	34	16	0
Fund initiated by Otago Division of New Zealand Branch of B.M.A. (second donation—total, £1,012 15s. 2d.); Medical Men in Otago chiefly, but many from other parts of New Zealand; Pharmacists of Otago and South Canterbury; Nurses in Otago; Otago Catholic Association and General Public	407	15	2

Subscriptions to the Fund should be sent to the Treasurer of the Fund, Dr. H. A. Des Voeux, at 14, Buckingham Gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited. Surgical instruments should be sent to the Master of the Society of Apothecaries, Apothecaries' Hall, Blackfriars, E.C.

A BEAUTIFULLY illustrated volume containing thirty-six memoirs has been dedicated to Dr. Erik Müller, Professor of Anatomy in the University of Stockholm, by friends and pupils on the occasion of his 50th birthday.

[1] *Journ. Physiol.*, 1916, vol. l, p. 512.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

Admission of Women to M.B. Examination.

THE grace for opening the first and second M.B. examinations to women was approved at Cambridge on November 18th.

UNIVERSITY OF EDINBURGH.

IT has been decided that no election of a successor to the late Earl Kitchener as rector of the university shall take place until this time next year, when, in the normal course, the term of office of the late rector would have expired.

UNIVERSITY COURT.

At a meeting of the University Court on November 13th Dr. Carstairs Douglas, of the Anderson College of Medicine, Glasgow, was recognized as an extra academical teacher in forensic medicine. Arrangements were approved by which Professor Alexis Thomson will act as interim professor of clinical surgery during the absence on war service of Professor Caird, and Dr. Chalmers Watson will carry on the work of Dr. R. A. Fleming, one of the senior lecturers in clinical medicine, who has proceeded to Salonica with a general hospital. The bust bequeathed by Sir William Turner has been placed, as he desired, in the anatomical museum. The general council has approved the ordinance for the foundation of a Chair of Tuberculosis.

UNIVERSITY OF GLASGOW

GRADUATION CEREMONY.

THE principal, Sir Donald MacAlister, presided at a graduation ceremony in the Bute Hall on November 11th, when the following degrees were conferred:

M.D.—*T. Walmsley, †J. B. M'Dougall, C. K. Stevenson, H. Yellowlees.

* With honours. † With commendation.

UNIVERSITY OF ST. ANDREWS.

UNIVERSITY COURT.

AT a meeting of the University Court on November 18th it was reported that General Sir Douglas Haig had been unanimously elected by the matriculated students to be rector of the university for the usual term of three years, and that a letter had been received from Sir Douglas Haig expressing his gratification at the honour conferred upon him. Sir Douglas Haig is a son of Mr. John Haig of Cameron Bridge, Fifeshire.

Miss Doris Livingstone Mackinnon, D.Sc., has been appointed lecturer on natural history. She is assistant to the professor of natural history at Dundee, and is at present engaged in medical work in a military hospital.

Principal Mackay was reappointed the representative of the university on the General Medical Council.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Meeting of Fellows and Members.

THE annual meeting of Fellows and Members of the Royal College of Surgeons of England was called for November 16th, but when the President, Sir W. Watson Cheyne, took the chair, those present were insufficient to form a quorum. After waiting the legal quarter of an hour, and the numbers wanting still three of the required thirty, the President said that the meeting could not be held, and that the five resolutions on the agenda dealing with the question of direct representation of Members on the Council could not be moved. Several protests were made at this procedure, which was declared to be impolitic even though strictly legal, and the protests were renewed when, immediately after the time limit, several fresh arrivals increased the numbers to over thirty. The President adhered to his decision that the meeting could not be held, but he consented to review the annual report (summarized in the BRITISH MEDICAL JOURNAL, November 11th, p. 670) and to permit some informal discussion.

Lieutenant-Colonel Josiah Oldfield said that the President in his statement last year was reported to have said that he regarded the College as a scientific and educational institution, and that those who were agitating on the representation question desired to make it a political one. The speaker pointed to several matters dealt with in the report which suggested that the College was interesting itself in other than scientific and educational matters. He also complained that the Council should have inserted in the report an anonymous statement from a member to the effect that provincial members were not in favour of motions on the subject of representation being brought forward; the offence was all the greater because, although the resolutions carried last year were printed, no word said in support of them was suffered to appear, while the President's defence was given fully.

Dr. George Jones, speaking as a barrister, also criticized the statements of the anonymous supporter of the council's policy, saying that the writer's arguments for resisting the proposed change were weak from the legal point of view, and in places the grammatical construction was such as to make the drift of the argument unintelligible.

Dr. S. C. Lawrence said that in refusing to allow the meeting to be held that day the President had made a great mistake of which the last had not been heard. He also regretted that his suggestion of a year ago had not been adopted, namely, that the five or six enemy names should be expunged from the roll of the Honorary Fellowship. He paid a tribute on behalf of the Members of the College to the late Sir Victor Horsley.

Some discussion ensued between Dr. Lawrence and the President with regard to the poll of Members undertaken by the Society of Members in 1908 on the question of direct representation. The President said that he had asked for the numbers of the poll, but they had been refused; if they had been greatly in favour of the demands made, they would surely have been given. Dr. Lawrence said that the President's inference was incorrect, though he was still unprepared to give the figures. Those who did not desire representation were negligible, and even in their case their apathy in the matter was due to the want of interest shown by the Council in the general body of practitioners.

Dr. David Roxburgh proceeded to criticize the Council for dilatoriness with regard to the instruction of general practitioners in the diagnosis and treatment of venereal disease. In London, he said, this matter had been left to the Panel Committee, and he regretted that the College had failed to take a leading part. The President said that the whole matter at the present moment was under consideration by a committee. On Dr. Roxburgh continuing to address those present, the President said that he had already allowed considerable latitude in discussion; it was not a regular meeting, and he must now leave the chair.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

THE following officers were elected on November 6th:—*President:* Dr. Ebenezer Duncan. *Visitor:* Dr. A. Freeland Fergus. *Treasurer:* Dr. W. G. Dun. *Honorary Librarian:* Dr. Alexander Napier. *Representative on the General Medical Council:* Mr. David N. Knox.

The Services.

EXCHANGES.

CAPTAIN R.A.M.C. at base hospital desires exchange to home station, London or near neighbourhood preferred; hospital for choice.—Address No. 4600, BRITISH MEDICAL JOURNAL, 429, Strand, W.C.

M.O. Cyclist, F.A., Kent, desires exchange to foreign service, preferably France.—Address No. 4599, BRITISH MEDICAL JOURNAL Office, 429, Strand, W.C.

Officer R.A.M.C. wishes to exchange from hospital ship to Eastern or London command; send particulars of work. Applicants should be over 45 or for home service.—Address No. 4598, BRITISH MEDICAL JOURNAL Office, 429, Strand, W.C.

Obituary.

DR. THOMAS WHITELAW, of Portobello, Edinburgh, died on November 9th after less than a week's illness. He began life as an inspector of banks, and served in Africa and India. Afterwards he studied medicine at Edinburgh University, and became M.D. in 1891. He settled in Portobello after taking his degree, and practised there until his death. He was keenly interested in the Portobello Sick and Destitute Society, and was member of its executive. He contributed to the JOURNAL, 1896, vol. i, p. 1317, a paper on the relation of haemorrhages to barometric pressure, his attention having been attracted to the subject by the repeated coincidence of what are "colliery warnings," appearing in the daily papers, with urgent messages to attend patients attacked with haemorrhage from the lungs. The funeral took place at Portobello Cemetery on November 13th.

DR. VICTOR COURTELLEMENT, professor of internal pathology at the medical school of Amiens, was killed by a shell on October 16th. At the Salpêtrière, Paris, where he worked under Professor Raymond, and at the Amiens Hôtel-Dieu, to which he was physician for many years, he carried out important neurological researches, and his thesis on the remote sequelae of cerebro-spinal meningitis was a valuable contribution to knowledge.

DR. R. H. VON EZDORF, of the United States Public Health Service, who died on September 8th, graduated at the George Washington University Medical School, Washington, in 1894. He made important researches on yellow fever and typhoid fever, but his special subject of investigation was malaria, on which he wrote much in the public health service reports. He was the author of the article "Malaria" in the *Reference Handbook of the Medical Sciences.*

Dr. Charles H. Hughes, of St. Louis, a distinguished specialist in nervous and mental diseases, died on July 13th at the age of 77. He graduated at the St. Louis Medical College in 1859, and after serving in the Civil War was appointed superintendent of the hospital for the insane at Fulton, a position he resigned in 1871. He was one of the founders of the Marion Sims Medical College and editor and proprietor of the *Alienist and Neurologist*. He was an honorary member of the Medico-Psychological Association of Great Britain, of the Russian Society of Neurology and Psychiatry, and of many other similar bodies.

Dr. David Braden Kyle, of Philadelphia, who died on October 23rd at the age of 53, had been professor of laryngology and rhinology in Jefferson Medical College since 1896. He was head of the department of laryngology, rhinology, and otology at St. Mary's Hospital, Philadelphia, from 1891 to 1893, and president of the American Laryngological Association in 1910 and 1911. He was the author of a textbook on diseases of the nose and throat which has gone through five editions.

Dr. Louis McLane Tiffany, of Baltimore, a surgeon of note, died on October 23rd, at the age of 72. He was a graduate of the University of Maryland, where he was demonstrator of anatomy from 1869 to 1874, and professor of operative surgery from 1874 to 1880. He occupied the chair of surgery from 1880 to 1902, when he retired with the title of emeritus professor. He was formerly surgeon to Johns Hopkins and St. Joseph's Hospitals, and to other institutions in Baltimore. He was a former president of the American Surgical Association, of the Medical and Surgical Faculty of Maryland, and of the Southern Surgical and Gynaecological Society.

Dr. Adoniram B. Judson, of New York, who died on September 20th, was born in 1837 at Maultain, Burma, where his father was an American missi nary. He studied medicine at Harvard and at Jefferson College, Philadelphia, where he graduated in 1865. After serving in the United States navy in the Civil War, he settled in practice in New York, devoting himself to orthopaedics. From 1878 till 1908 he was orthopaedic surgeon to the out-patient department of New York Hospital. In 1887 he helped to found the American Orthopaedic Association, of which he was vice-president in 1889 and president in 1890. From 1886 till his death he was statistical secretary to the New York Academy of Medicine. He was chairman of the Section of Orthopaedic Surgery. Dr. Judson was the author of several works on subjects within his special province and on public health.

Medical News.

A meeting of the Odontological Section of the Royal Society of Medicine will be held at the society's house, 1, Wimpole Street, W., on Monday next, at 8 p.m., when the President, Mr. W. B. Paterson, F.R.C.S., L.D.S., will give his address, and a report on the Paris Dental Congress will be presented by Mr. T. A. Coysh, L.D.S.

The Health of Munition Workers Committee, appointed by the Ministry of Munitions, has issued a memorandum (No. 14, Cd. 8387. Price 1d.) on washing facilities and baths. It contains descriptions and working drawings of a washing trough, and of douche baths for males and females respectively.

A mechano-therapeutic department has been presented to Bath War Hospital by Mr. C. Chivers. It provides mechano-therapeutic apparatus, and radiant heat and whirlpool baths. In the latter the whirlpool is produced and air introduced into the water in the manner described by Dr. Nunneley elsewhere in this issue.

The prize of £50 and the medal of the institute offered by the Royal Sanitary Institute for the best thesis setting out a complete and practical scheme for maternity and child welfare work, suitable for adoption by local authorities, has been awarded to a joint essay by Miss Isabel Macdonald, secretary, Royal British Nurses Association, and Miss Kate Cropper Atherton.

A committee has been formed at Springfield, Illinois, to collect £100,000 for the foundation of a memorial to the late John B. Murphy, of Chicago. It is proposed that the memorial shall be "a living power making for the advancement of surgery on both the scientific and the moral sides." It is probable that it will take the form of an institution for surgical research.

It is believed that both political parties in Canada will make compulsory health insurance of wage earners part of their programme for the election which is to come after the war. In the United States a bill providing for compulsory insurance has been drafted by the American Association for Labor Legislation and will be introduced next year in more than twenty State legislatures.

The annual meeting of the American College of Surgeons was held at Philadelphia in the last week of October. It was decided to form an international committee, on which every State in the Union and the Provinces of Canada should be represented, to take steps for the enactment of laws for the protection of the public against untrained surgeons, the prevention of dishonest practices, and the provision of means for post-graduate training in surgery. Chicago was chosen as the permanent head quarters of the college, and Dr. George W. Crile was elected president.

We have received the report of the seventy-fifth session, 1915-16, of the Reading Pathological Society. The most distinctive event in this session was the holding of two of the monthly meetings of the society at the War Hospital, where cases of interest drawn from the wards were shown and discussed. As in the previous session, the annual oration and the summer excursion were abandoned, their place being taken by ordinary meetings. The roll of honorary members has been depleted by the deaths of two orators of the society, Sir James Goodhart and Sir Victor Horsley. Although the attendance of members at the meetings fell below the average of previous years much interesting work was got through and many instructive specimens and patients with various types of diseases were brought forward.

The usual monthly committee meeting of the Medical Sickness Assurance Society was held on November 17th, when Dr. Major Greenwood was in the chair, in the absence, through indisposition, of Dr. F. J. Allan. The reports submitted showed for the previous month a slight upward tendency in sickness claims, due largely to members wounded on active service, but the sickness experience for the whole year up to the end of October was considerably under the expectation, although it is estimated that at least 1,000 of the society's members are on active service in various parts of the world. The new proposals showed a decline on previous figures, but the proportion of new members taking advantage of the new endowment assurances issued by the society is larger than formerly. It has been decided to continue accepting new members who may be either actually in or about to join His Majesty's Forces in the non-combatant branches, as, so far, the society's experience does not justify it in either charging extra rates or discontinuing acceptance of these proposals. Further information can be obtained from the Secretary, Medical Sickness and Accident Society, 300, High Holborn, London, W.C.

The Princess Christian opened a "microscopical conversazione" at the head quarters of the Y.M.C.A. in London on Friday evening. The range of the exhibits was certainly a tribute to the labour of many enthusiastic microscopists as well as to the microscopical section, which was thus demonstrating to the public the kind of work it carries on in the m litary camps and hospitals. The specimens shown ranged from gold dust to water-fleas, and from the shimmer of beetle's wings to a swarm of maggots in a fragment of two-year-old Cheddar. In the large hall cinematographic displays were given at intervals, the subjects being wholly scientific. The films revealed the motions of blood, the action of trypanosomes in sleeping sickness, and of the micro-organisms in relap-ing fever. Elsewhere in the building lectures were being delivered, one of them by Mr. F. Martin Duncan on carnivorous plants, and the other by Dr. G. H. Rodman, who has applied the photographic colour plate to photomicrography with excellent results. It was stated that exhibitions and lectures of this kind are constantly being given in Y.M.C.A. huts, and the men of His Majesty's Forces show the most eager interest in this investigation into the world of the minute. We understand that lectures have been prepared by expert microscopists on the action of various micro-organisms, including the *Spirochaeta pallida*.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS not answered are requested to look at the Notices to Correspondents of the following week.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

THE telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are: (1) EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2631, Gerrard. (2) FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard. (3) MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

W. asks any user of the auto-wheel to give him his experience of it. W.'s district is moderately hilly.

QUILL-PEN asks for advice in the case of a well-nourished woman, aged about 35, who has suffered from amenorrhoea for about eight years, from biliousness and headache for one to two years, and from a chronic cold with occasional bronchitis and dyspnoea on slight exertion for nine months. There are no physical signs. Blood count: Red corpuscles 6,750,000, haemoglobin 85, colour index 0.6; white corpuscles 14,680, ratio 1 white to 400 red; polymorphonuclears 79.0, small lymphocytes, 17.4, large lymphocytes 3.6, eosinophiles 0.0, mast cells 0.0.

INCOME TAX.

R. P. asks for an expression of opinion as to whether army pay earned during December, 1915, but not paid until January, 1916, should be reckoned in addition to his "civil earnings" assessment, which is based on the 1915 profits, for purposes of his abatement. The 1915 profits did not exceed £700.

*** Income assessed under Schedule E, including army pay, is properly reckoned according to the period of accrual. R. P.'s total income for the present financial year is, therefore, (1) his military pay from the commencement to April 5th, 1917, *plus* (2) the amount on which he is liable to assessment for his civil earnings. Unless, therefore, he can show the amount of his profits for 1916, or 1916–17, to be less than the 1915 figure, and substitute the smaller amount under Section 13 of the Finance Act, 1914 (Session 2), he must lose the benefit of any abatement.

LETTERS, NOTES, ETC.

TREATMENT OF TETANUS.

DR. W. J. YOUNG (Harston, Cambridge) writes: I have not noticed that trial has been given during the war to the method of treatment advocated in the JOURNAL some time ago by Dr. Jasper Creagh, of Buenos Aires. He recommended saturation of the patient with sulphur by giving drachm doses every two hours, and by rubbing in strong sulphur ointment. He said he had never known it to fail.

BOOKS FOR BRITISH PRISONERS.

THE British Prisoners of War Book Scheme (Educational), which is managed by a committee consisting of representatives of the Board of Education and the Board of Trade, the Joint Committee of the British Red Cross and the Order of St. John, the Admiralty, the War Office, and Dr. Hagberg Wright (London Library), exists to provide British prisoners of war interned in enemy or neutral countries with educational books. We are informed that among a large number of requests are some for books on medical subjects. Special books asked for recently are: *Psychological Medicine* (Craig), *Sanity and Insanity* (Mercier), *Criminal Responsibility* (Mercier), *Tropical Diseases* (Castellani). Readers who may be able and willing to contribute one or more of the above works are invited to forward to Mr. Alfred T. Davies at the Board of Education, Whitehall, London, S.W., a list of the books they can offer. They will then be notified as to the acceptance of their gifts. Further particulars of the Book Scheme may also be had on application to him.

ARSENIC IN SYPHILIS.

A CORRESPONDENT writes to say that he believes salvarsan to have no remedial effect in cases of syphilis of the central nervous system, and to suggest that an ideal method for their treatment "would be to inject the lymph of arsenic-eating people (Styrians) deprived of its protein into the subarachnoid space . . . . In lieu of this animals might be given arsenic with a view to using their lymph." However well worth trying, these suggestions are, unhappily, not without their difficulties. (1) The inhabitants of Styria and the Austrian Tyrol who eat arsenic are Austrian subjects, and there might be a difficulty in getting them to come forward at the present time and be bled for the supposed benefit of their foes. (2) There is reason to believe that tolerance to arsenic depends mainly upon development of the power of not absorbing it from the stomach and intestine. It has not been shown, we believe, that the blood of arsenic eaters is rich in arsenic. (3) It is thought that any arsenic that is absorbed from the alimentary tract circulates in the blood, and is excreted in the urine in the form of an organic combination. It is to be feared, therefore, that blood serum deprived of its protein might also be deprived of any arsenic it might contain.

THE RETURNED SOLDIER.

DR. ROWLAND JONES (Walthamstow) writes: In the SUPPLEMENT of November 4th, p. 125, Mr. Turner, speaking of disabled soldiers, states "that these men should not be discharged, but kept under a certain amount of discipline." Does he not consider that these poor fellows have had just about enough discipline? As an acting M.O. I have had about 2,000 sick soldiers pass through my hands, and there is nothing they appreciate so much as the treatment they receive from a man unfettered by any military code. Surely we medical men, who owe our safety to these men, can undertake to look after them without always considering "How much pay?" As to Mr. Turner's statement about "stand drinks," of course, amongst the millions of soldiers there are plenty of fools, but our army represents the *élite* of the nation. It is the same myopic view as that of the War Office, who do not seem able to grasp the fact that they are dealing with quite a different class of men to what they have heretofore been accustomed. As to the enormous amount of venereal disease at the front and at home, I can only state that out of 2,000 sick soldiers I have only found two cases.

SCHOOL RUNS.

AMAZED writes: I was consulted recently by the parent of a boy at a public school as to whether he should be allowed to take part in the school runs, since he suffered from a "stitch" in the right side, and was compelled to stop running till this passed off; in consequence of this he was caned for not "running off the stitch," although he had not been previously warned that any boy seen to stop running would be so punished. The runs take place when it is too wet to play football. The distance is roughly two miles. The run begins forty-five minutes after the mid-day dinner. Assuming the boy has no organic disease, I would like to have the opinion of your readers on the following points: (1) Whether the "stitch" in the circumstances mentioned is a symptom to be ignored? (2) If not, whether a caning is a justifiable remedy? (3) Whether "running off the stitch" is appropriate treatment? (4) If not, what treatment, if any, should be adopted? (5) Whether a boy's work can reasonably be expected to be good if he has to take part in runs for which he feels unfit, when all the time he knows that he has hanging over his head a caning if he temporarily "falls out"?

INCOME TAX.

DR. J. W. YEATMAN (Auburn, S. Australia) writes: Referring to your editorial on the basis of calculation of income tax in the JOURNAL for July 15th, our experience may be useful. Some years ago the Commissioner of Taxes in Adelaide discovered that the profession as a whole was paying income tax on a cash basis. He insisted on the book debts being taken into consideration, which practically meant that we each had to pay the State double the amount we owed. Since then I have arrived at my income liable to taxation by adding the amount "good on books" at the end of the year to the cash received for current year and deducting from that the amount "good on books" at end of the previous year. This works out at about the same rate as an assessment on cash receipts. The only unfairness was in the first year, and all book debts—good, bad, and doubtful—are taken into consideration. The Commissioner has approved of this method in writing. By adopting this plan and deducting last year's book debts medical men at home would put themselves on the safe side and be saved from having to pay double, when the authorities wake up to the fact that they are only taking into consideration actual cash returns.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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Seven lines and under	0	5	0
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An average line contains six words.

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NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.